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TRANSCRIPT OF CONFERENCE - POLLUTION OF INTERSTATE WATERS, MISSISSIPPI RIVER, ST. LOUIS METROPOLITAN AREA - HELD IN ST. LOUIS, MISSOURI, 4 MARCH 1958

Public Health Service
Washington, D. C.

April 1958

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TRANSCRIPT OF CONFERENCE

NTIS

POLLUTION OF INTERSTATE WATERS

MISSISSIPPI RIVER

ST. LOUIS METROPOLITAN AREA

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U. S. DEPARTMENT OF HEALTH EDUCATION, AND WELFARE

Public Health Service

April, 1958

CONFERENCE AT ST. LOUIS, MISSOURI
On Interstate Pollution
In the Mississippi River

Soldiers' Memorial Building
St. Louis, Missouri

March 4, 1958

Chairman:
Mr. Murray Stein
Chief of the Enforcement Section
Water Pollution Control Program
U. S. Public Health Service
Washington 25, D.C.

Conferees:
Mr. Milton M. Kinsey
Chief Engineer,
Bi-State Development Agency
St. Louis, Missouri

Mr. Albert W. Happy
Chief Engineer
Division of Health
Jefferson City, Missouri

H. W. Poston
Department of Health,
Education and Welfare
Chicago, Illinois

Mr. C. W. Klassen
Technical Secretary
Illinois Sanitary Water Board
Springfield, Illinois

(A list of those in attendance is attached as "Appendix A")

MR. STEIN: The conference is opened.

This conference in the matter of pollution of interstate waters of the Mississippi River in the St. Louis Metropolitan area, involving the States of Illinois and Missouri, is being held under the provisions of the Federal Water Pollution Control Act and, in accordance with the terms of that Act, was called by the Surgeon General of the Public Health Service.

The purpose of the conference is to bring together the state and interstate water pollution control agencies, the localities concerned and industries and the Public Health Service to review the existing situation, the progress which has been made, and to lay a basis for future action by all parties concerned and to give the states and localities an opportunity to take any remedial action which may be indicated under state and local law.

The conference technique is a rather old one As a matter of fact, it is used by many state agencies informally in the usual conduct of their business in the field of water pollution control. The notion of a conference long ago was proposed by the United States Supreme Court in the famous case of New York and New Jersey involving interstate pollution.
The court said as far back as 1921, and I quote:

"We cannot withhold the suggestions inspired by the consideration of this case that the grave problem of sewage disposal presented by the large and growing populations living on the shores of New York Bay is one more likely to be wisely solved by cooperative study and by conference and mutual concession on the part of representatives of the states so vitally interested in it than by proceedings in any court, however constituted."

This, I think, is particularly applicable to a complex metropolitan situation such as we have in the St. Louis area.

Under Section 8 of the Federal Act the Surgeon General has notified the official state and interstate water pollution control agencies of this conference. These agencies are the Illinois State Sanitary Water Board, Bi-State Development Commission, and the Missouri Division of Health. Under the law this is a conference between these official agencies and the Public Health Service. The official agencies, of course, are privileged to bring whomever they wish to the conference and have them participate in the conference.

The conferees have been designated by these agencies, and for Illinois the conferee is Mr. Clarence Klassen, for Missouri the conferee is Mr. Albert Happy, for the Bi-State Development Commission, the conferee is Mr. Milton Kinsey, for the Public Health Service the conferee is Mr. H. W. Poston, and my name is Murray Stein. I'm from Headquarters, Public Health Service.

Both the states and the Federal Government have responsibilities in dealing with interstate water pollution control problems. The Federal Water Pollution Control Act states that the states have primary rights and responsibilities for taking action to abate and correct interstate pollution. It has always been the policy of the Public Health Service to recognize this traditional role of the states. The function of the Public Health Service is to encourage the states in these activities. However, the Public Health Service is charged by law with specific responsibilities in connection with interstate pollution control problems.

The Federal Water Pollution Control Act provides that pollution of interstate waters which endangers the health or welfare of persons in a state other than that in which the pollution originates is subject to abatement When the Surgeon General is requested by the official state agencies to call a conference under the law, he is obliged to do so Request has been received from all the official agencies represented here In response to these requests the Surgeon General has called this conference

This conference I might point out, is a logical sequence to much state activity in this area and much federal activity in this general area on the Mississippi River System. For example similar conferences already have been held in Omaha. St Joseph and Kansas City.

We realize that in many areas there has been considerable progress made toward the solution of interstate pollution problems by the cities, the states, industries and local political bodies.

The conference will be useful in providing a clear record delineating the progress which has already been accomplished and indicating what still needs to be done to correct interstate pollution problems.

Under the Federal Act the Surgeon General is required at the conclusion of the conference to prepare a summary of the conference which will be sent to all conferees.

The summary according to law must include the following

(1) Occurrence of pollution of interstate waters subject to abatement under the Federal Act;

(2) Adequacy of measures taken toward abatement of pollution; and

(3) Nature of delays if any, being encountered in the abatement of pollution

It is suggested that the conference discussions be directed toward discussing these points so that we may prepare a serviceable summary at its conclusion In addition the law requires the

Surgeon General to determine at the conclusion of the conference whether effective progress toward abatement of pollution is being made.

To aid the Surgeon General in making this determination, it is strongly suggested that the conferees agree upon a time schedule of remedial action. Such a time schedule, of course, should be a realistic and reasonable one. Once this time schedule is accepted by the conferees, I should point out that it is primarily the function of the states, and certainly a primary function of the Federal Government in conjunction with the states, to see that this time schedule is adhered to.

Now a word about the procedure governing the conduct of the conference. Miss Poole is making a stenographic report of these proceedings for the purpose of aiding us in preparing the summary and also providing a record of what is said and done here. We will make both the transcript of the conference and the summary available to the conferees.

An agenda has been distributed to the conferees. The agenda is to aid us in directing our discussion toward the points required to be covered by law. However, that agenda can be adjusted to meet particular schedules or points as they arise.

All the conferees will be called upon to make statements. The conferees, in addition, may call upon the participants they have invited to the conference to make statements.

At the conclusion of such statements, the conferees will be given an opportunity to comment or ask questions and at the conclusion of the conferees' comments or questions I may ask a question or so, too.

This procedure has proved effective in developing a clear statement of the problem and agreements on equitable solutions.

Now before we actually begin to call on the folks, we will pass a sheet of paper among the folks in the audience and would appreciate you signing your names and indicating your organizations if you wish to do so.

At this point, I should like to call on Mr. H. W. Poston of the Public Health Service, who will present the general picture of interstate pollution in this area.

Mr. Poston.

MR. POSTON: Mr. Chairman, members of the conference, in 1951 - 1952, the Public Health Service, in cooperation with the state agencies of Illinois, Missouri, and the Bi-State Agency, conducted a study of stream conditions in the St. Louis Metropolitan Area and prepared a report.

At the time the Surgeon General called this conference, some five months ago, we felt, and the stated felt, that bringing this report up to date was essential. Mr. F. W. Kittrell, Chief of our Stream Sanitation Studies, in the Sanitary Engineering Center in Cincinnati, was asked to bring this report up to date. For some three months he has worked bringing this report up to date with information that was readily available from the state agencies, from water users along the river, and other places that he could obtain this information. Mr. Kittrell took a trip on this river, and I think I would be remiss in my duty here if I didn't tell you some of the things that you might see if you were to make a similar trip. You, too, can get out on this river and see some of the conditions that were observed by the party that took this trip. A microscope or a chemical test, bacteriologist, are not necessary. You can visually observe these things.

We took the trip from the riverfront upstream to the mouth of the Missouri, down the Chain of Rocks Canal, and down to Jefferson Barracks Bridge and back up along the Missouri side of the river. We observed sewers that carried all kinds of waste. These wastes were red from packing house waste, blood and so forth, black from industrial waste. We had green sewers that were carrying green-colored waste, and then there were sewers that just carried, oh, gray material, domestic sewage. These sewers weren't small, all of them. They were up to 23 feet wide. Some of the damages that could be observed downstream, at Chester Waterworks, that we visited, contained -- there was grease on top of the filters. After Chester does the maximum of treatment of their water supply, and a most excellent job of treatment, they still are bothered with feathers and other materials that carry on through and are only physically removed by the filtering.

We went through the pride of the Army Corps of Engineers, the new locks on the Chain of Rocks Canal, and it was observed oil over the banks below there, and also within the locks. These things are very real and you can see those.

The Public Health Service felt that it was necessary that we go further than this, that we take into consideration the technical aspects, and we have asked Mr. Kittrell to prepare a report for us and give to you at this time his summary of conditions as he found them.

I call on Mr. Kittrell now.

MR. STEIN: As Mr. Kittrell is coming up, I should like to indicate to other participants that it would be advisable for you to come up and deliver your statements from the lectern, and if you have any prepared statement you may give Miss Poole, sitting down here in front, a copy of it, and if there are other copies you may want to give them to the people at the desk here.

Mr. Kittrell.

MR. KITTRELL: It would be presumptuous for me to come to St. Louis and try to tell you who live in the Metropolitan Area how much the Mississippi River means to you. Fortunately that is not my principal duty at this conference. My principal duty here is to tell you what your sewage, industrial wastes and garbage are doing to the Mississippi River; and yet I cannot tell you convincingly what your wastes are doing to the river without touching to some extent on what the river means to you and to your downstream neighbors. If your wastes did not damage uses of the river there would be no reason for concern about their effects.

Very few major metropolitan areas are so blessed with the super-abundance of water that flows through the heart of the St. Louis Metropolitan Area. In fact the Mississippi River at and below St. Louis is so big that it has gained the reputation in some circles of being practically immune to damage by pollution.

As early as 1931 and again in 1934, however, M. M. Ellis of the U. S. Fish and Wildlife Service examined the Mississippi from St. Louis to Cairo and found that dissolved oxygen in this section was relatively low at times, and warned that further uncontrolled increases in organic pollution could be harmful.

Around 1938 to 1940 fishermen began to complain that fish taken from the St. Louis to Cairo section of the river frequently were so unpalatable that they could not be eaten. Over the years this section of the river has gained an exceedingly bad reputation on this score.

In 1946, W. S. Platner of the U. S. Fish and Wildlife Service reported the results of a survey of the Mississippi River which also covered the St. Louis to Cairo section. His findings of relatively low dissolved oxygen were similar to those of Ellis 12 and 15 years earlier. Growing interest in pollution of the river in the St. Louis Metropolitan Area culminated in an extensive cooperative survey of the situation, to which Mr. Poston has already referred. Field work occupied most of 1951 and 1952, and a report was published by the Bi-State Agency in 1954. This report established definitely the existence of excessive pollution of the Mississippi in and below the St. Louis Metropolitan Area. The findings of that report will not be quoted at this time since they essentially are duplicated by the findings of our recent review of the situation in preparation for this conference.

Our recent findings are incorporated in the report, "Pollution of Interstate Waters of the Mississippi River in the St. Louis Metropolitan Area," published in February, 1958, by the same four cooperating agencies that produced the 1954 report. My comments at this time are drawn from that report.

First let's get an idea of the wastes that we are talking about and where they come from I have several charts here that depict some of the more important wastes

Chart No 1 shows the raw sewage or untreated sewage from the one and one-quarter million people that is dumped to the river in the Metropolitan Area The large red circle represents the relative amounts of sewage from the Illinois and the Missouri side They are not drawn to any particular scale except in relation to each other About seven-eighths of the sewage enters from the Missouri side and one-eighth from the Illinois side

Chart No 2 is a representation of the putrescible organic wastes of all kinds This chart shows sewage industrial wastes and garbage The effect of these wastes on dissolved oxygen content of the river is equivalent to the effect of sewage from five and one-quarter million persons This compares to the actual sewage population of one and a quarter million that I mentioned earlier The total of all wastes in terms of oxygen demand is equivalent to the waste from five and a quarter million people

These charts show if you can't read the legend from the back of the room the large red segment of the circle represents the proportion of industrial wastes from the Missouri side; the blue represents the sewage and the yellow represents the garbage

On the Illinois side again the red represents industrial wastes and the blue represents the sewage and these two circles, again are in proportion to one another

Chart No 3 shows the phenol-like materials that are discharged to the river I would like to ask you for the moment to ignore the blue circles I will come back to those later The red circle shows the relative quantities of phenols from the Illinois and from the Missouri side of the river The total of phenol-like substances in 1952 was found to be about six tons per day Of this 94 percent came from the Illinois side and six percent from the Missouri side You see that the Missouri circle is quite small Possibly some of you at the back of the room can't even see it That represents on the Missouri side about six percent of the total Much effort and expense have been directed toward reduction of these materials since 1952. and I expect that we will hear about the results of these activities later

There are other wastes which contribute to the pollution problem The sewage industrial wastes and garbage include 460 tons per day of suspended solids with approximately one-half of the total coming in from each side of the river There are floating solids which make the river unsightly Of these the ground garbage is an obvious offender Oils and greases cover the surface of the river from time to time Petroleum refinery wastes toxic metals acids and other heavy chemical wastes also enter the river.

Public water supplies in the Metropolitan Area take over 200 million gallons of water daily from the Mississippi River and from the Missouri River just before it joins the Mississippi. Chart No. 1 shows the locations of the major river intakes in the area and at neighboring communities downstream.

This, as you recall, is the chart showing the points at which sewage enters the river, and the relative proportions from each side of the river, and it also shows, the blue circles, the location of water intakes. We have one up at Alton above all sources of pollution in the area. We have one -- a couple over on the east side of the river, the East St. Louis and Interurban Water Company. We have one on the west bank of the river which serves the City of St. Louis, one on the Missouri above the confluence of the two rivers, which also serves St. Louis. We have two supplies on the Missouri that serve St. Louis County. Then downstream we have a water supply taken from the river at the Menard Prison, the Illinois Menard Prison. We also have a water supply taken from the river at Chester, Illinois, another at Cape Girardeau, Missouri, and a fourth at Thebes, Illinois.

With respect to the water supplies from the Metropolitan Area, two of them, representing about 60 percent of the total water used, are taken from the Mississippi below sources of waste in the Metropolitan Area.

The East St. Louis and Interurban Water Company supply taken from the river below the petroleum refinery operations in the Roxana-Hartford-Wood River area, has long been plagued by taste and odor problems. Consumer complaints have been numerous and vociferous. Special treatment facilities have been provided at considerable expense by the water company and extraordinary operating procedures have been necessary on the part of water plant personnel. Even their best efforts have been to little avail at times.

The St. Louis City Chain of Rocks supply has been subjected to the same problem through the water intake structure located on the Illinois side of the river in the vicinity of the Chain of Rocks Bridge. The solution in this case has been the virtual abandonment of this intake structure, built in 1913 at a cost of more than $400,000.

It is understood that the refineries have made made major improvements in waste disposal in recent years which presumably will be discussed during this conference.

The two foregoing situations are examples of what the Metropolitan Area has been doing to its own water supplies. Now let's turn to what has been happening to your downstream neighbors.

About 30,000 people living on the banks of the Mississippi River between the St Louis Metropolitan Area and the mouth of the Ohio River are dependent on the Mississippi for the water that they drink and use in their homes Inmates and employees of the Illinois State Prison at Menard, Illinois, and inhabitants of Chester and Thebes, Illinois, and of Cape Girardeau, Missouri, use water that has received the pollution from the Metropolitan Area When you consider the fact that every person using the sewerage systems in the Metropolitan Area daily contributes about 400 billion coliform organisms or sewage bacteria to the sewers you get an idea of the bacterial contamination that is introduced to the Mississippi daily Even the mighty flow of the Mississippi cannot dilute the resulting 500 quadrillion sewage bacteria per day to low levels Fortunately these bacteria die off in the river, but some of them survive long enough to reach the water intakes of the downstream communities Chart No. 4 shows the resulting average bacterial contamination at the downstream intakes in relation to the 5,000 per 100 milliliter limiting average recommended by the American Water Works Association and the U. S. Public Health Service The yellow circles, the interior circles, are in proportion to the recommended 5,000 per 100 milliliter limit for a source of municipal water supply The blue that covers the rest of the circle shows the actual values of coliform organisms determined at various downstream points The volume unit 100 milliliters, is roughly equivalent to one good mouthful of water At Chester and the Menard Prison -- incidentally, the first circle right below merely shows the bacteria level not in relation to the water supply; there is no public water supply at that point The first public water supplies are at Menard and Chester downstream, and here the bacterial contamination is about four times the recommended limit At Cape Girardeau the contamination is about 70 percent in excess of the recommended limit and at Thebes contamination is about 60 percent in excess of the recommended limit The water treatment plants at these communities remove most of these bacteria but the records show that at the Menard Prison and at Cape Girardeau and Thebes a few of them occasionally penetrate the defenses of the plant and remain in the water distributed to the consumers Only the Chester Plant appears to have been successful in achieving essentially complete removal of the sewage bacteria This plant is equipped for application of an extraordinary variety of treatment process and has tried and abandoned a number of others in efforts to combat the effects of pollution

Bacterial contamination and its attendant health hazards has not been the only problem imposed on these water plants by the pollution from the St Louis Metropolitan Area All of them have had to provide special treatment facilities and to employ special treatment procedures to combat tastes and odors caused by waste materials originating in the Metropolitan Area Chart No 5 illustrates at least one of the causes of this problem It shows the levels of phenol-like substances that have been found in the river below the Metropolitan Area Here again the two or at least this circle immediately below town is not related to a public water supply The circle farthest upstream is in the vicinity of the East St Louis Interurban Water Supply Intake and shows the phenol-like materials found there in relation to the recommended limit. At Menard and Chester downstream, phenol-like materials have exceeded the recommended limit several fold, and the same applies to Cape Girardeau. We did not have incidentally information as far downstream as Thebes on phenol, so we do not have a circle at Thebes

Finally, the Chester and Menard Prison supplies have been troubled by floating and suspended materials that are aesthetically offensive. Grease particles float on the surface of the water in the filters. At Chester, especially grease coats the walls of the filters Operators at both plants from time to time have to remove chicken feathers and entrails and condoms from the filters Fortunately these materials are strained out by the sand filters and do not enter the distribution system.

The majority of industries in the Metropolitan Area obtain water from the municipal systems but a few of the larger ones use over 40 million gallons per day which they pump directly from the Mississippi. All of these are drawn from the river below sources of waste in the area which add to the cost and difficulty of water treatment Existing and anticipated use of river water by power plants for cooling is over one and one-half billion gallons daily

All large bodies of water near major population centers are important recreational assets The Mississippi River at St Louis is no exception

Most people obtain real aesthetic pleasure and satisfaction from the scenic beauty of a large expanse of water Those who have enjoyed this pleasure at St Louis would be disillusioned on approaching close to the river and seeing the floating materials that litter the surface of the water in the Metropolitan Area Predominant among the floating materials are patches of grease citrus fruit peels and scraps of leafy vegetables, typical of garbage that constitute a broad continuous trail from the mouth of the Mill Creek sewer at least as far downstream as Jefferson Barracks Condoms abound in the floating material An oil slick, typical of sewage or oily waste pollution covers the river from bank to bank in the lower end of this section Completion of the proposed metropolitan water front development project and of the Mississippi River Highway will bring this condition forcibly to public attention

The city has provided a boat ramp near the Veterans Memorial Bridge for the hundreds of pleasure boaters who bring outboard motor boats by trailer from miles around These boats are used for fishing, for cruising and for the increasingly popular water sport of skiing. These pleasure seekers are exposed not only to the unpleasant sights of the floating materials described earlier but also to the invisible though very real, health hazard of excessive bacterial contamination in and below the Metropolitan Area The average drop of water in this area sprayed from the prow of a speeding boat into the face of an occupant contains about 20 sewage bacteria The skier who falls and submerges in the water in the more highly contaminated areas may come up with a mouthful of water containing as many as half million sewage bacteria. Numerous complaints are made regarding damage to the paint on pleasure craft by oil on the water surface

Those who fish for pleasure in and below the area are exposed to health hazards in much the same manner as are the pleasure boaters They encounter the additional hazards of handling fishing tackle and fish contaminated by the sewage bacteria Those who indulge in this sport below the Metropolitan Area are limited however

May I have chart 3 back?

The evidence is that downstream use of the river for sport fishing is influenced markedly by the taste of the flesh of fish taken from this section Chart No 3 illustrates the results of a count of sport fishermen made by plane on Memorial Day of 1956 In the pooled section of the Mississippi River above St Louis, from East Dubuque to Alton, Illinois sport fishermen averaged 9 3 per mile of river. In the 8 mile section of open river between Alton Dam and the mouth of the Missouri River above St Louis the average was 21 6 per mile From the mouth of the Missouri to Cairo below the Metropolitan Area, the average was only 0 4 per mile I don't know whether you can even see this small circle at the back of the room which represents the sport fishing per mile between St Louis and Cairo, 0 4 per mile Actually the total for the whole area -- this is a distance of around 200 miles -- there's only 81 sport fishermen in that whole length of river

River navigation is important to the St Louis Metropolitan Area Large quantities of materials are transported economically both to and from St Louis and through St Louis to other centers of population upstream and downstream from the area Those who operate the navigation equipment are exposed to the health hazards of sewage contaminated water The costs of navigation are increased by the effects of pollution especially the floating materials on floating and fixed equipment and navigation aids

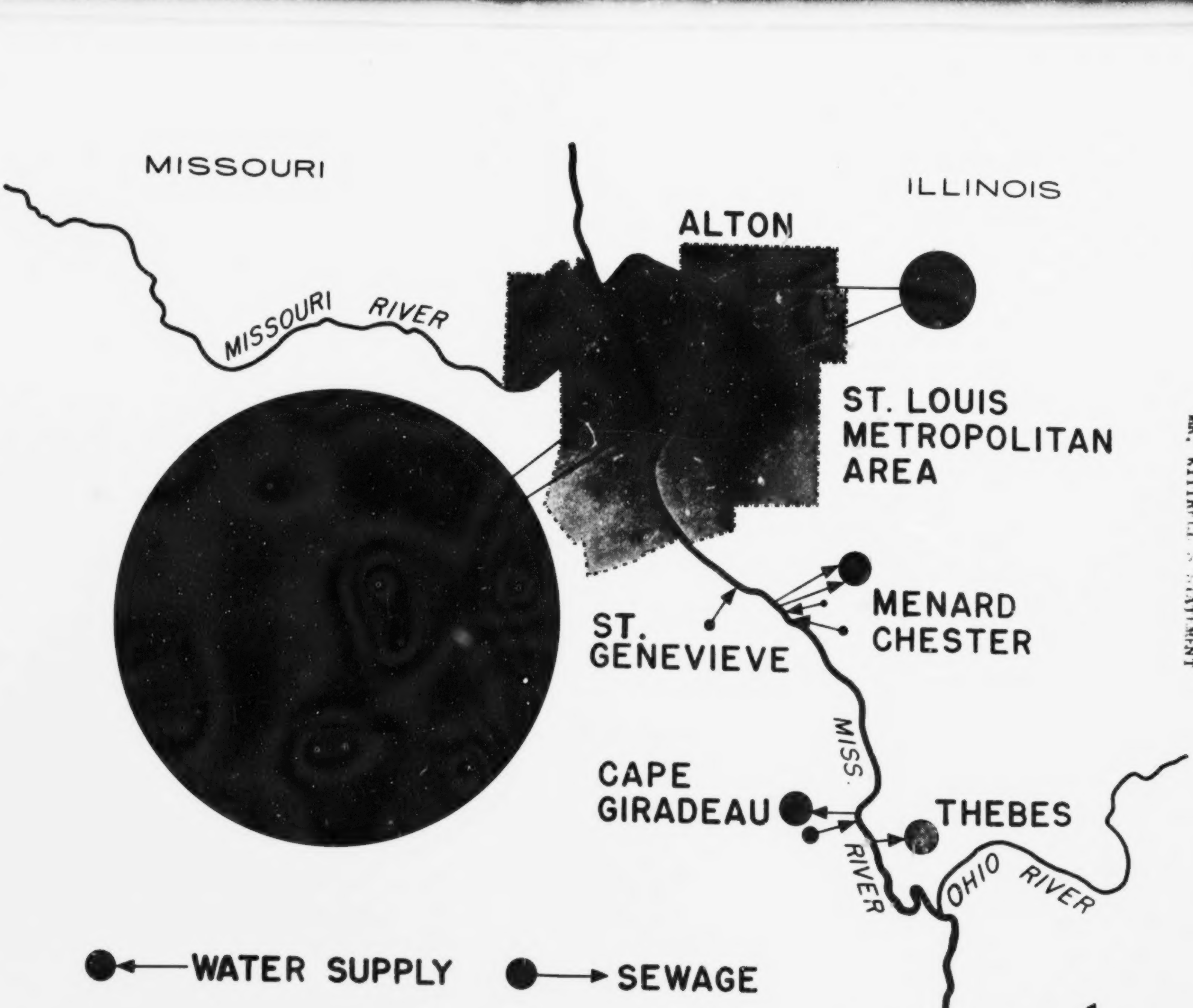
Commercial fishing in the Mississippi River between St. Louis and Cairo has dwindled almost to the vanishing point The principal cause appears to be the taste in the flesh of fish taken from this section of the river The most probable cause of the taste is the phenol-like wastes discharged to the river in the St Louis Metropolitan Area Chart No 6 illustrates data on fish catches by Illinois commercial fishermen from East Dubuque to Cairo The data were compiled by the Illinois Natural History Survey Division In 1950 Illinois commercial fishermen took an average of 7 000 pounds of fish per mile between East Dubuque and St Louis, compared to 840 pounds per mile between St Louis and Cairo By 1956 the upstream yield had increased about

25 percent of 8,700 pounds per mile, while the downstream yield dropped to 120 pounds per mile, or less than one-seventieth of the upstream yield. In 1956 upstream dollar value was $975 compared to $16 per mile downstream. If we assume that the downstream yield could have been the same as that upstream in 1956 this represents a loss to Illinois commercial fishermen alone of about $4,100 per mile of river, or $225,000 for the year. If the potential were the same for Missouri commercial fishermen the total loss for the entire river section was $450,000 in 1956.

It is evident that pollution of the Mississippi River in and below the St. Louis Metropolitan Area constitutes pollution of interstate waters subject to abatement under the Federal Water Pollution Control Act as such pollution endangers the health and welfare of persons in states other than those in which the discharges contributing to such pollution originate.

R H

MR. KITTRELL'S STATEMENT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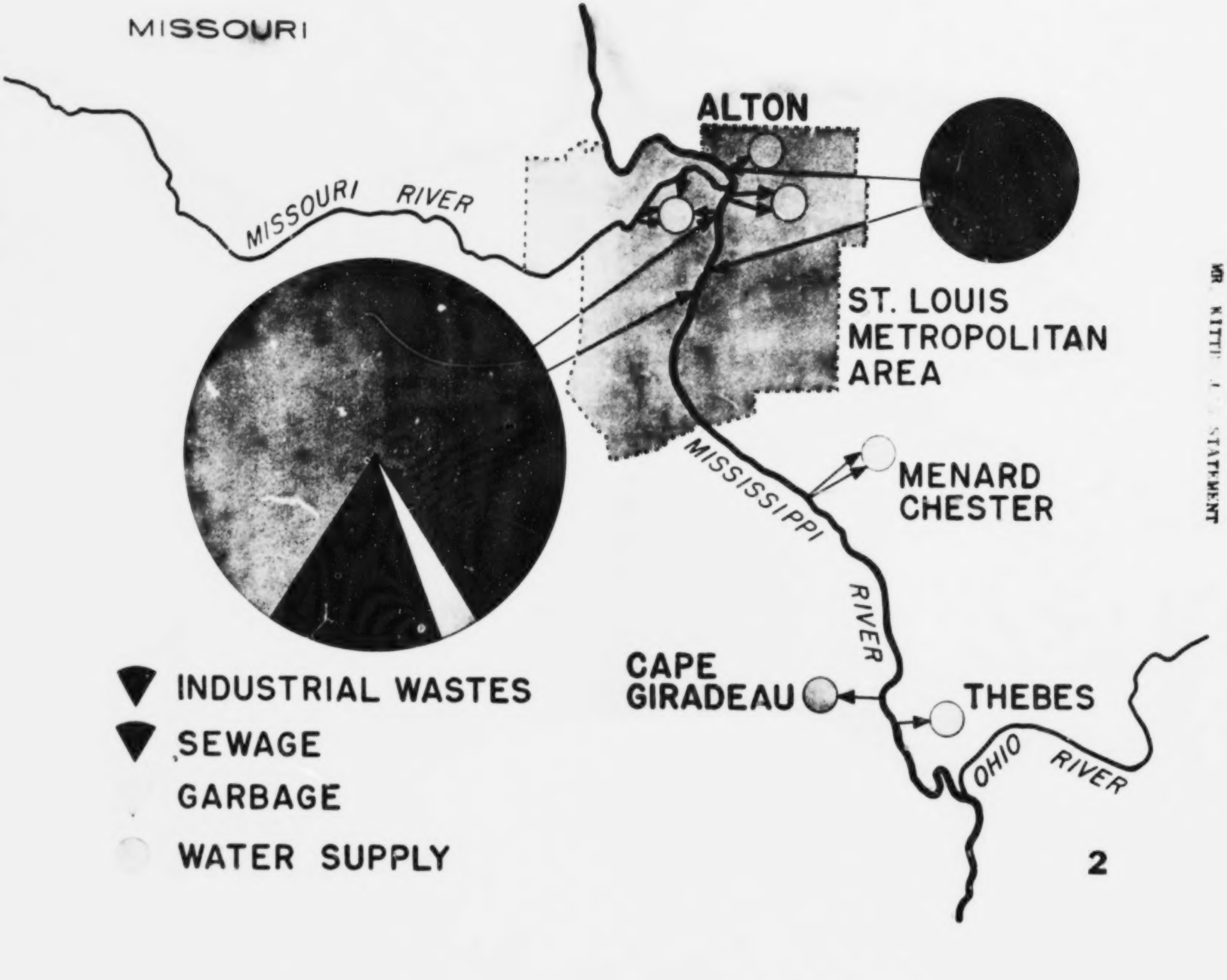
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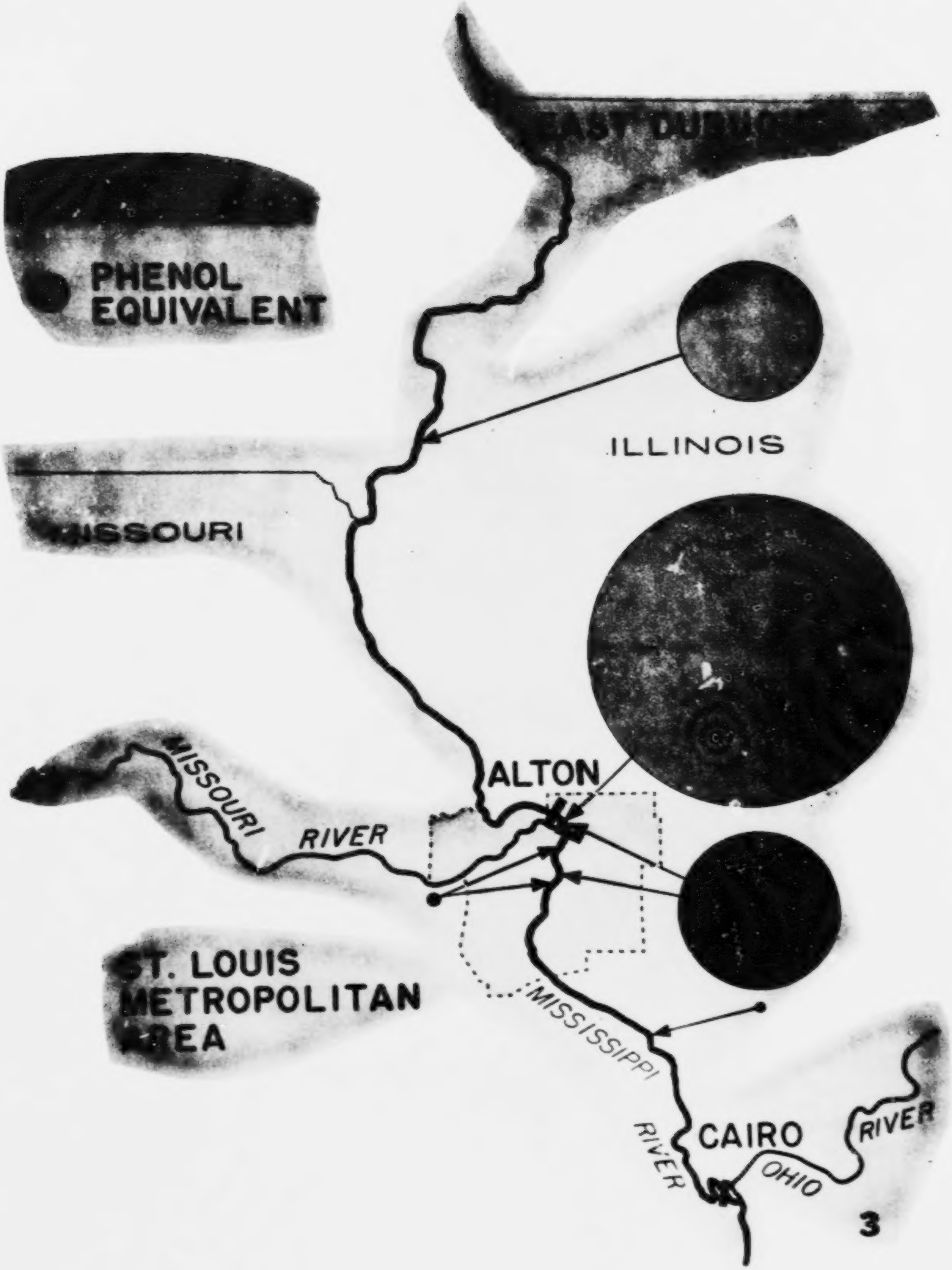
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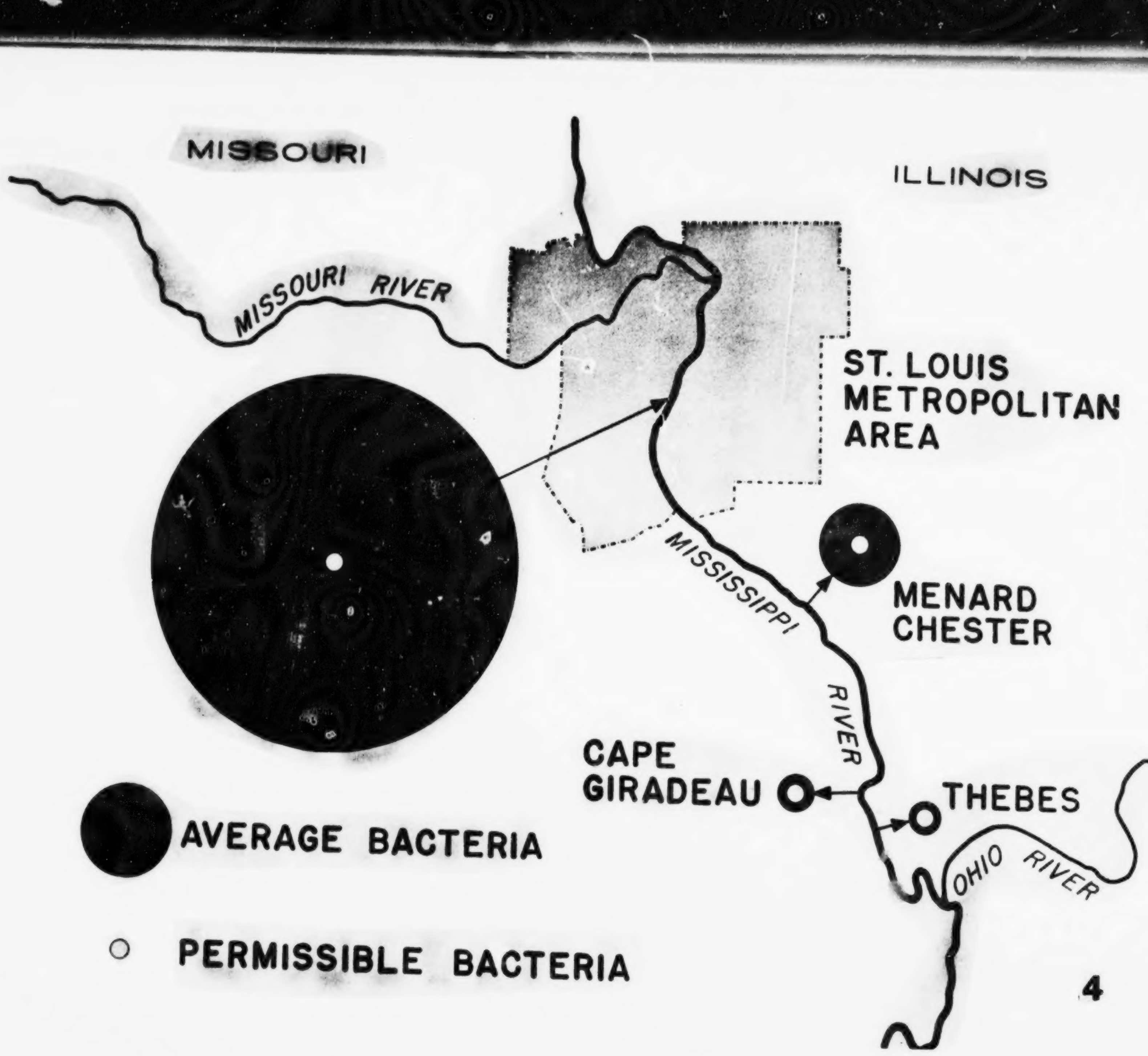
MR. KITTRELL'S STATEMENT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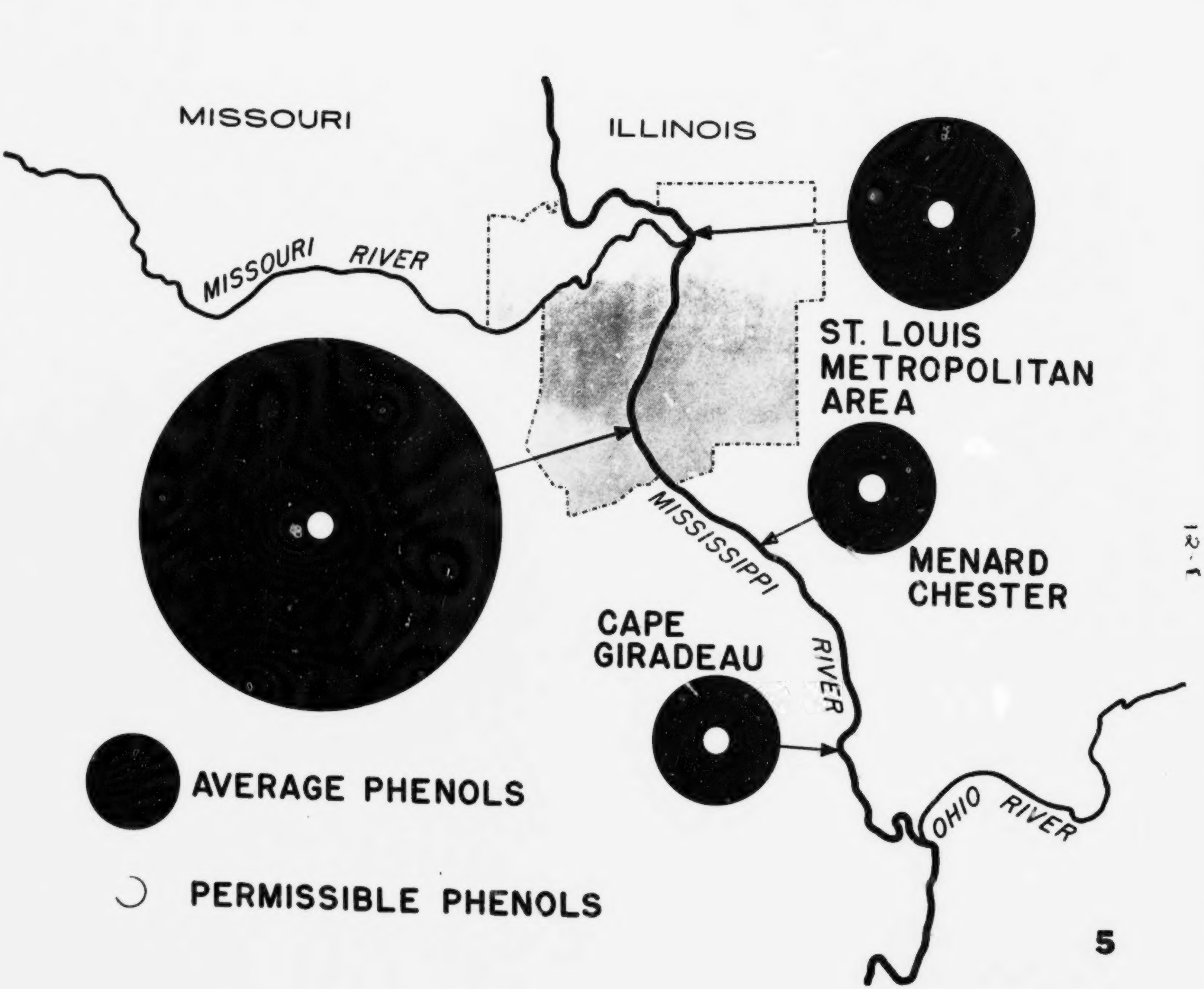
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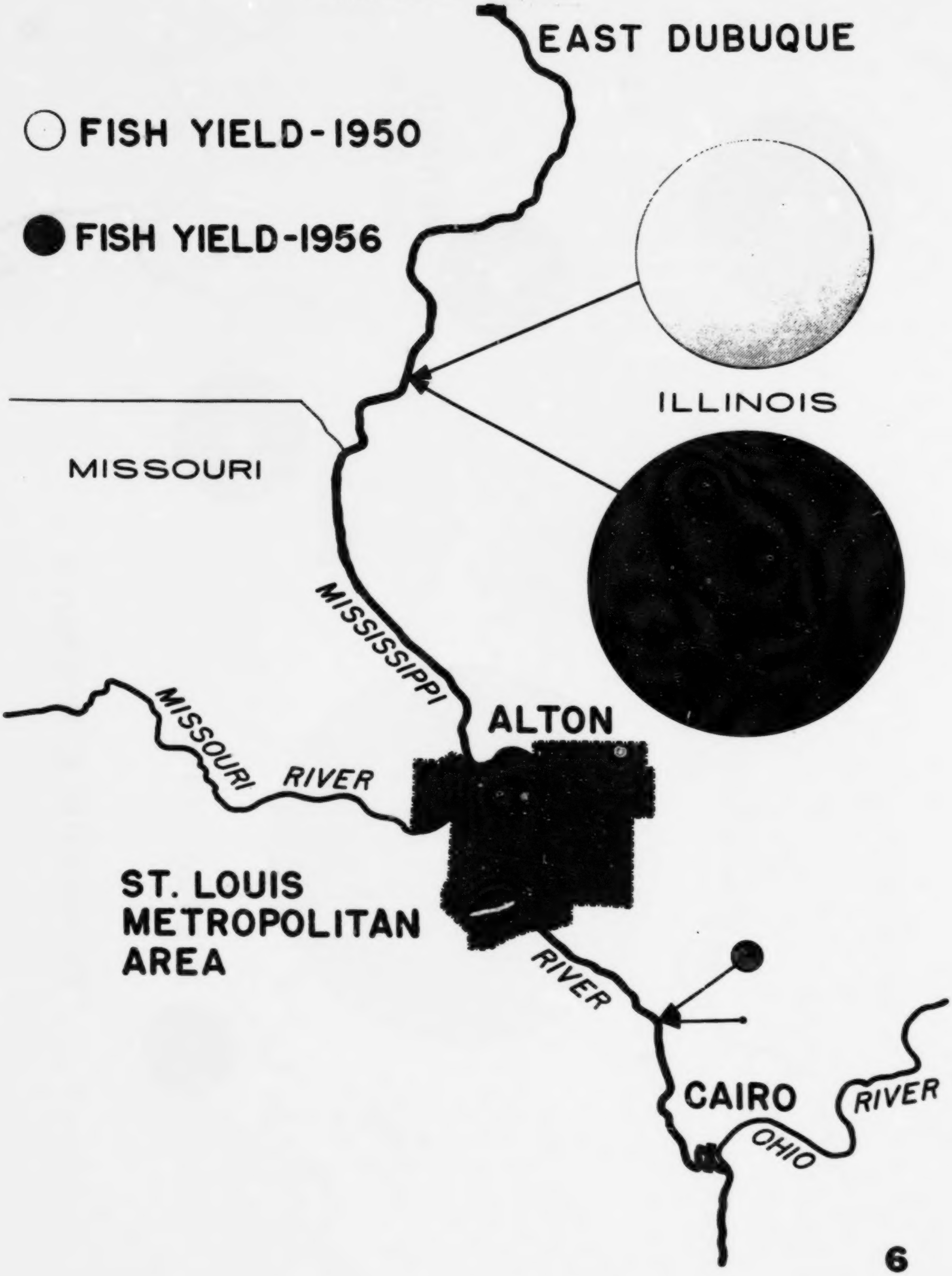
12.F

MR. KITTRELL'S STATEMENT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● FISH YIELD-1956
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ALTON
ST. LOUIS METROPOLITAN AREA
RIVER
CAIRO
OHIO RIVER

MR. STEIN: Thank you Mr. Kittrell.

Now, we will ask the conferees if they have any questions.

Mr. Klassen, do you have any questions or comments to ask Mr. Kittrell or Mr. Poston?

MR. KLASSEN: I think not, Mr. Chairman, other than to emphasize some of the phenol loadings that were shown were from the 1952 survey, and, as I think will be brought out in our later presentation, there has been considerable improvement in our Illinois industries in that respect.

MR. STEIN: Mr. Happy?

MR. HAPPY: I have no questions.

MR. STEIN: Mr. Kinsey?

MR. KINSEY: I have no questions.

MR. STEIN: I think at this point we will go on to the next point on the agenda dealing with the occurrence of pollutions of interstate waters.

First we will call on Mr. Milton Kinsey, who will speak on the historical background and interests of the Bi-State Agency in pollution of these waters.

Mr. Kinsey.

MR. KINSEY: The Bi-State Development Agency is an instrumentality of the States of Missouri and Illinois. It was created by a Compact entered into under authority of the legislatures of the two states and approved by the United States Congress. The first article of the Compact sets forth that the states "agree to and pledge each to the other faithful cooperation in the future planning and development of the Bi-State Development area, holding in high trust for the benefit of its people and of the nation the special blessings and natural advantages thereof". The agency has jurisdiction over an area comprising Monroe, Madison and St. Clair Counties in Illinois and St. Charles, St. Louis and Jefferson Counties and the City of St. Louis, in Missouri. It is impressed with a wide variety of duties, including those of preparing area-wide coordinated plans which will be generally beneficial to the development of the Bi-State area. The agency, therefore, has a definite legal responsibility to concern itself with the type of question which is under consideration here today.

The question of pollution of the Mississippi River is one of long standing and has been the subject of intermittent complaints from various sources for more than 25 years, especially from commercial fishermen and those interested in recreation. Although some sporadic investigation had previously been made, it was not until April of 1948 that concerted action by official bodies was initiated in an attempt to determine the characteristics of the problem. At that time an informal committee representing the State of Missouri was formed to prepare a preliminary report with respect to the pollution of the Mississippi River and to recommend a course of action. This committee after a one-year study concluded:

(1) That objectionable conditions do at times exist in the Mississippi River in and below the St. Louis Metropolitan Area.

(2) That the actual extent and magnitude of the objectionable conditions could not be estimated within a reasonable degree of accuracy due to the absence of sufficient data.

The committee, therefore, recommended that a study in sufficient detail and duration be made to definitely establish whether a stream sanitation problem was present.

In April of 1950 this committee presented to the Bi-State Agency a memorandum which stated in part and I quote, "The rapid development of the St. Louis Metropolitan Area is believed to have created problems of stream pollution in and below this Metropolitan Area. In view of the importance of the many water uses of the Mississippi River it is considered essential to conduct a stream sanitation survey study in and below the Metropolitan Area to determine the extent of such stream pollution problem. Since the area involved is of the States of Missouri and Illinois and lies within the jurisdiction of several agencies, it is considered desirable that such a survey should be conducted as a cooperative venture of the several agencies involved." End of quote. The report concluded by recommending that the Bi-State Development Agency sponsor the conduct of the recommended survey and that an advisory board be appointed to have general supervision of the project. As a result, the Board of Commissioners of the Agency agreed to act as the sponsoring body for a pollution study of the Mississippi River and authorized its staff to proceed immediately.

The study was truly a cooperative one in which more than 15 official agencies participated. The City of St. Louis, for example, contributed the use of laboratory space at the Chain of Rocks Water Works, the United States Public Health Service contributed the very competent services of Mr. Stanley G. Monroe who acted as Project Manager and was in charge of all field activities; various departments of the two states and of the Federal Government contributed the services of engineers, biologists and chemists, as well as the use of boats, trucks, a mobile laboratory and other equipment. Special experts with respect to certain phases of the study were provided by the

Illinois Natural History Survey, the Missouri Conservation Commission and the U. S. Fish and Wild Life Service. The main costs of the survey were met from aid-in-grant which the Bi-State Agency received from the U. S. Public Health Service, although funds of the Agency were also used. The field investigation continued over a period of more than two years and involved the collection of nearly 2500 water samples, 25,000 laboratory analyses, inventory of the nature and sources of pollution, special studies with relation to biological factors, and many other investigations in related fields. The results of this work have been incorporated in a report entitled "Mississippi River Water Pollution Investigation", which has already received wide distribution and which we hereby wish to introduce by reference, into this record here today.

We believe that this report, representing as it does, the effort of approximately 50 engineers, chemists, biologists, and other experts, has been prepared in a careful, scientific manner, and that it represents an impartial approach to the problem, and seeks a solution which will benefit all segments of the Bi-State area. The supplemental report of Mr. Kittrell which brings the information down to date, is equally meritorious.

Since completion of the original investigation, the Advisory Committee under whom it was conducted has continued in existence and has held regular meetings in an attempt to secure cooperation of industry and public bodies in the abatement of pollution.

In this effort the Committee has had no small success and gratefully acknowledges the cooperation it has received, especially from those industries who have expended large sums to eliminate or reduce pollution of the Mississippi.

Others who will appear at this conference will recite in detail the accomplishments of the Committee program. These recitations, however, will indicate that there is still a great deal to be done.

As previously indicated the first concentrated official effort to combat pollution in the St. Louis reach of the Mississippi River was begun in April, 1948. Today's conference, therefore, falls within a few days of the tenth anniversary of that beginning. It is sincerely hoped that the next ten years will see greater progress.

MR. STEIN: Thank you, Mr. Kinsey.

Mr. Klassen, do you have any questions or comment?

MR. KLASSEN: No.

MR. STEIN: Mr. Happy?

MR. HAPPY: I have none.

MR. STEIN: At this point we should like to call on Mr. Clarence W. Klassen of Illinois, who will present a statement on source of pollution, nature of wastes from Illinois, and effects of pollution on present and potential water uses in Illinois.

Mr. Klassen.

MR. KLASSEN: The Illinois Sanitary Water Board is the Illinois Water Pollution Control agency and was first created by the 1929 Act, later amended, and continued in force until superseded by the present and similar 1951 Act. The Board is charged "to control, prevent, and abate pollution of the streams, lakes, ponds, and other surface and underground waters in the state". Provisions of the law require a permit from the Board for all new domestic or industrial sewerage systems and for changes or additions to existing ones. The Board membership consists of the Directors of the State Department of Public Works, Agriculture, Conservation, Public Health and two appointed members representing industry and municipalities, respectively. The State Sanitary Engineer serves as the Technical Secretary and Administrative Officer and the Division of Sanitary Engineering of the State Department of Public Health is designated as the basic technical staff.

Some of the activities of the Board in its programs of Water Pollution Control are: reviewing plans and specifications for proposed domestic and industrial waste sewerage systems, including treatment works; requesting periodic submittals of reports upon waste system operation; making necessary investigations and reports upon natural waters; and other activities pertinent to a reasonable and satisfactory program of sanitation and conservation of natural waters.

About 6.8 million persons in Illinois are served by sewers and of these, 94.4 percent are tributary to treatment works, some of which are not fully adequate. Of the sewered population whose domestic wastes are not treated, 73 percent are on interstate waters, principally along certain reaches of the Mississippi and Ohio Rivers. The industrial wastes, as regards the proportion and location of that not receiving adequate treatment, roughly parallel the domestic sewage previously described.

An investigation of Mississippi River water pollution below the Alton Dam was made during 1951-52 by the Bi-State Development Agency, the States of Missouri and Illinois and the U. S. Public Health Service. The results of that study were published in 1954, as a Bi-State Development Agency report previously referred to by Mr. Kinsey, "Mississippi River Water Pollution Investigation, St. Louis Metropolitan Area," a copy of which was directed to most of the municipalities and major industries using the river in the area studied.

The Mississippi River is a very large stream, its average monthly discharge at St. Louis for the period 1933 to 1950 was 166,900 cubic feet per second, and therefore, many persons believed that its vast assimilative capacity and the dilution afforded for wastes would always prevent objectionable impairment of its water quality. The increases of tributary population and the phenomenal industrial growth in the St. Louis area, however, have already caused serious impairment of the bacterial, chemical and physical quality of the Mississippi River water quality as was shown by complaints made and by the results of the first comprehensive study of the river in the St. Louis area, the 1951-52 survey presented in the 1954 published report, previously referred to.

There is no treatment of the mixed sewage discharged to the Mississippi River from the public sewer systems of the Illinois incorporated communities, sanitary districts, and institutions of: Alton; East Alton; Wood River; Hartford; Granite City; Madison; Venice; East Side Levee and Sanitary District which includes Brooklyn, Cahokia, East St. Louis, Fairmount City, National City, and Washington Park, as well as the previously named cities of Granite City, Madison and Venice, the latter three of which have separate sewer outfalls; Monsanto; Dupo; Columbia; Illinois State Prison, Menard Branch; and Chester. These sewage discharges of domestic and sewer-connected industrial wastes, on the basis of the 1954 report, contributed pollutional material equivalent to over 1,000,000 persons into the river.

Industrial waste outlets discharge to the Mississippi River from: Owens-Illinois Glass Co.; Alton Box Board Co.; American Smelting and Refining Co.; Olin Mathieson Corporation (Western Cartridge Co.); Standard Oil Co. (Indiana); Shell Oil Co.; International Shoe Co. (Wood River Tanneries); Sinclair Oil and Refining Co.; and Union Electric. A considerable number of large industries discharge their wastes via village, city or sanitary district sewers and, although their names do not appear individually, their waste contributions are included with the municipal discharges. Some of the larger of such municipal-sewer-connected industries with respect to volumetric discharge and constituents of waste, are: At Granite City: Dow Chemical Co. (magnesium extrusion), Granite City Steel Co. (steel); Union Starch and Refining Co. (corn products); at East St. Louis: Armour and Co. (meat packing); St. Louis National Stockyards; Socony Mobil Oil Co. (petroleum refining); Swift and Co. (meat packing); at Monsanto: Monsanto Chemical Co. The population equivalents of all industrial wastes from the Illinois side were estimated as 1,286,000; the domestic sewage as 140,000; and the total of both industrial and domestic wastes population equivalent from Illinois as 1,426,000.

The pollution of the Mississippi River waters caused excessive bacterial content and disagreeable tastes and odors, and they are all water sources, thereby requiring abnormal quantities of treatment chemicals and higher costs for operation of public water supply purification plants at the East St. Louis and Interurban Water Co., Illinois State Penitentiary at Menard, Chester and Thebes. Even with the installation of special treatment facilities and the use of chemicals in excess of the requirements for a so-called normal raw water, there were periods when a palatable finished water could not be produced, also, it must be remembered that potentially serious hazards to the public health are ever present and that explosive water-borne epidemics may result from the human consumption of a water produced from a highly polluted stream if at any time the efficiency of plant operation personnel or water treatment methods fail.

Complaints made and survey observations showed that the pollution received by the Mississippi River also resulted in the tainting of fish flesh thus reducing the enthusiasm of sport fishermen and the value of commercial catches; caused unsightly water surface; stained and smeared shores, docks and watercraft; and subjected persons using the stream recreationally or in commercial pursuits to undue health hazards because of sewage contamination and, to financial loss because of oil, grease and scum damage to wearing apparel, equipment and boats.

I would like to augment these last general statements with some specific information and examples I want to first call upon a representative of the East St Louis and Interurban Water Company, who has had long experience in treating water from the Mississippi, and who has served approximately fourteen Illinois municipalities, involving a population of about a quarter of a million people, a representative of the East St. Louis and Interurban Water Company. Mr. Brown, their chemist.

Would you make a statement, Mr. Brown?

MR. STEIN: Mr. Brown, before beginning, would you give your full name and title for the purpose of the stenographic report?

I hope everyone else who comes up will do so.

Thank you.

MR. BROWN: O. H. Brown, chemist of the East St. Louis and Interurban Water Company, East St. Louis.

Mr. Chairman, conference members:

Our State Health Departments, the Bi-State Agency and U.S. Public Health Service most certainly should be commended for their efforts in sponsoring legislative measures for the abatement of stream pollution.

As Chemist of the East St. Louis and Interurban Water Company, I speak from years of experience regarding one of the most serious stream pollution problems in the nation. Fortunately, that problem has just recently been greatly alleviated and our thanks should go out to those responsible for it.

The wastes principally responsible for our problem originated in the highly industrialized Wood River area on the Illinois side of the Mississippi River, at a point approximately nine miles above our intake. Fortunately for the City of St. Louis, these wastes did not reach beyond the middle of the Mississippi River, as the two rivers, the Missouri and the Mississippi, do not mix to an appreciable extent until they get well downstream.

Our problem became acute in the early 1930's due to the rapid growth of refining companies in the Wood River area, and to the International Shoe Tannery. These wastes consisted of phenols sometimes reaching concentrations of 500 parts per million, in the effluence to the river, and many times running around a hundred parts per million. Then there were mercaptans, sort of a polecat odor, if you're not familiar with it, reaching intensities at times that they could be detected at our intake station a half a mile from the river. Our filtration plant at times smells like a refinery. Other chemicals from these industries consisted of various kinds of oils, gasoline, hydrocarbons and fuel oil, hydrogen sulphite and acid sludge, and many others. The threshold odors at our plant at times reached intensities as high as one thousand.

To cope with this situation we enlisted the aid of our State Health Department and Sanitary Water Board, and they in turn called a conference of the officials of the industries responsible. As a result of this conference, a program was instigated whereby the refineries would remove the more serious pollutants at the source of supply. Improvements were made by the industries which resulted in partial elimination of the more serious pollutants. The International Shoe Tannery was the first to comply by constructing two large lagoons through which their wastes were diverted, giving sedimentation, oxidation and biological action, which tended to clarify their waste water considerably and reduce the threshold odor of waste by more than 50 percent. Then the refineries set up neutralizing installations for containing phenols and mercaptans from their spent caustic soda, and they also made improvements in separator boxes for more efficient oil recovery, and as a result of these improvements our threshold odors decreased to a point where we could just get by with the use of heavy dosages of coagulants and activated carbon, and later with sodium chlorite for control of tastes and odors.

Conditions gradually improved over the years as a result of constant vigil and close cooperation between our company and the industries, but, naturally, where the human element is involved, accidental spills of highly objectionable wastes occurred from time to time, giving us considerable trouble. Conditions, even so, were still very unsatisfactory. Odors in our raw water thresholds were still running high, reaching as high as 100 during low river stages and low temperatures.

Then as a result of these surveys by our Bi-State Agency and the United States Public Health Service the industries involved allocated large sums of money for treating all of their wastes going to the river. In 1956, the Sinclair Oil Company constructed two lakes or lagoons through which they diverted all of their waste water. This resulted in sedimentation and clarification removal of oil and solids, oxidation, biological action, improving their waste decidedly, reducing their threshold odors from between 50 to 125,000 down to approximately 10,000. Then in 1957 Standard Oil Company built a series of five lagoons or lakes to which they are now diverting all of their waste water, resulting in oil removal, removal of solids by sedimentation and clarification and oxidation, biological action all of which has reduced their threshold odors from approximately 16,000 down to about 3,500, and, finally, the Shell Petroleum Corporation, in the Wood River area, built an entirely new sewage treatment plant at approximately a cost of a million dollars, and one which has just recently been installed, put into operation this last December That will be described, I'm sure by a representative of their plant, but it consists essentially of aeration, sedimentation, oil separation, and finally filtration through a biological trickling filter. The effluent from this plant is remarkable as compared to what it used to be The water is now clear; the phenol and mercaptan contents have been reduced to a minimum; the threshold odor has been reduced from between 50 and 150,000 down to 2,500.

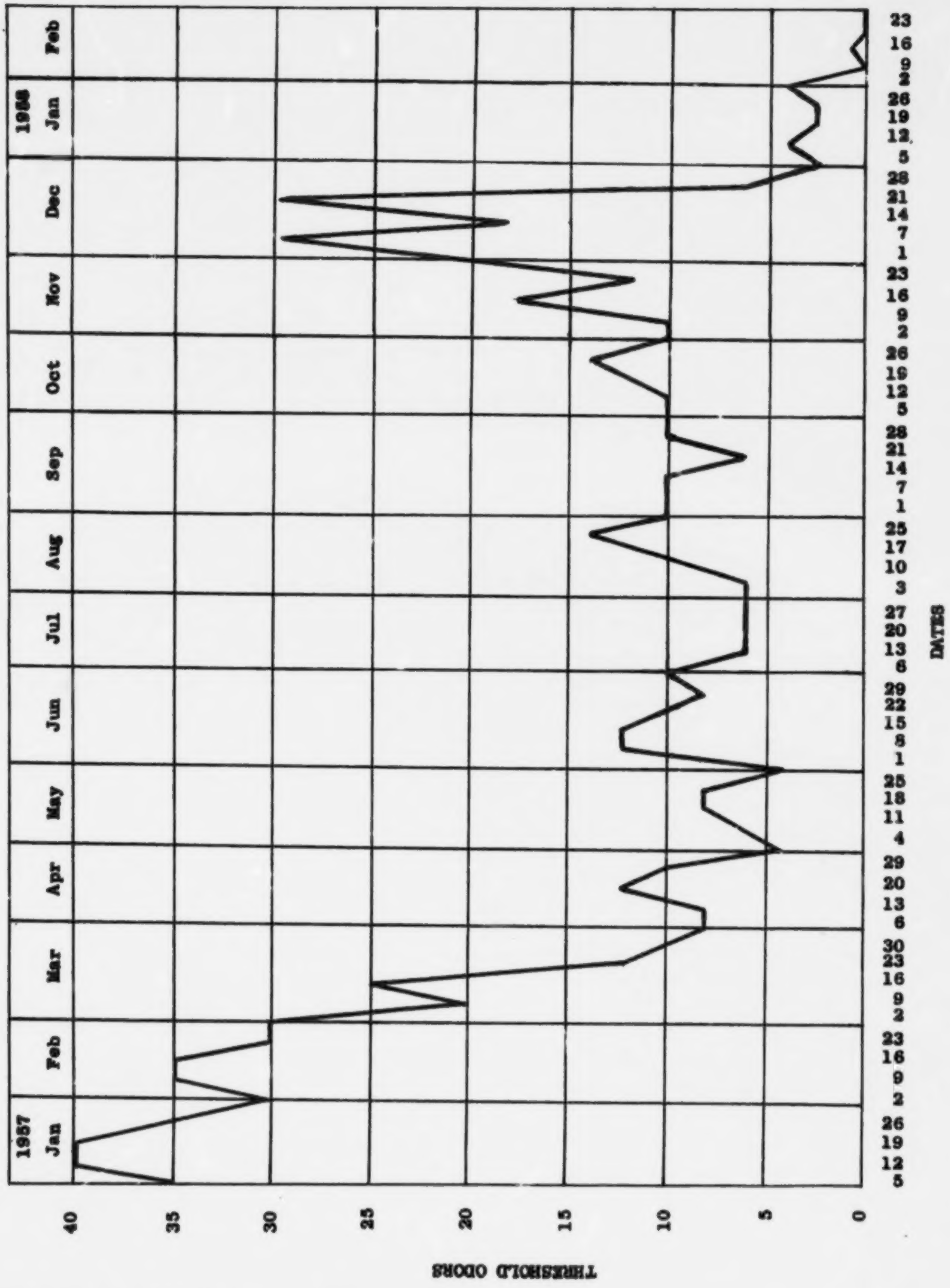
The total effect of improvements by these four industries has been to almost completely eliminate those industries' wastes from our raw water supply, even during the recent low-river stages of January and February of this year Our threshold odors of our river water have dropped at our intake approximately 95 percent

In closing, I just want to say that those of us who have had experiences with stream pollution certainly appreciate the importance of this program and the far-reaching effect it will have on the health of millions of people when all of the industries and the cities comply with the specifications as set forth by our health agencies

I thank you.

20-H

MR BROWN'S CHART No. 1



MR. KLASSEN: Thank you, Mr. Brown.

The Southern Illinois Penitentiary has been referred to by Mr. Kittrell. It has a long experience record of taking the water from the Mississippi River, converting it into a water supply for that institution, and I am going to call on the penitentiary's Warden to add anything, or his staff, to the statements here.

Warden Ross Randolph.

MR. RANDOLPH: My name is Ross Randolph. I am Warden of the Illinois State Penitentiary at Menard, Illinois.

As Warden of the Penitentiary I have the responsibility of furnishing water to some 3,000 inmates and personnel. The quality of the water has a lot to do with the morale of the inmates, and the Warden, of course, one of his chief responsibilities is the security and the morale of those people.

We use a proportionately large amount of water per person in that we use around a million gallons of water a day. We are very much interested in the type of water that we get.

I would like to call on my chief engineer, who has, I think, about as great an experience as anybody I can think of. He has been at Menard some 40 years--as the chief engineer, not as an inmate -- (laughter). He has acted as past-president of the Illinois Water Works Operators Association. He is, I think, considered -- could be considered an expert in water works operation. I would like for Mr. Oscar Marquardt to tell you something about the problems that we have had at Menard Branch of the Illinois State Penitentiary.

MR. MARQUARDT: Thank you, Warden, and Mr. Chairman, delegates:

We are down about 80 miles south of St. Louis. We have had quite a difficulty in treating our water so that it would meet with the state specifications. So this last year the plant was reconstructed, which cost $400,000, and our water has been much improved, but, still, when the river stage gets low we have a lot of phenols and organic matters, everything that comes down the river we get it, so we feel that the upstream people should correct this some way.

At Menard we dump our sewage into the river, the same as you people, so the people below us get whatever little we make.

At this time I want to make a statement as the operators' chief engineer that we are using an increase of at least three times the amount of chemicals that we used when we opened up this filtration plant in 1924, and it is due to the condition of the river which is caused by this large increase in industries, population, and use of water, more water in the city, and I feel that whether the state can handle this problem, it may become necessary that the government step in, and when the government steps in, the river will be corrected, as they have done on the Ohio River.

I was in Cincinnati just about three months ago, and they have completely built a new disposal plant.

I don't think I have much more to say. If there are any questions you gentlemen want to ask, I would be glad to answer them.

MR. STEIN: Do you have any questions to ask?

MR. HAPPY: I have no questions.

MR. STEIN: Mr. Poston?

MR. POSTON: No, I don't.

MR. KLASSEN: Thank you, Mr. Marquardt and thank you, Warden.

MR. STEIN: Mr. Brown, are you still in the room?

Mr. Poston has a question for you. I wonder if you would entertain that question?

Mr. Poston.

MR. POSTON: I wanted to ask Mr. Brown what this high threshold odor meant to him. Does it mean just higher chemicals to you in the way of requiring more chemicals to treat the water or are there other disadvantages? Are you able to remove these threshold odors and these other impurities in your regular treatment processes successfully?

MR. BROWN: Just up to a certain point can you remove them. When the threshold odors get, oh, I would say up to 20, or so, they become very difficult to remove, that is, threshold odors of a refinery nature organic. Above that they become very difficult to remove, sometimes reach as high as 1000, and oftentimes running around a hundred, so we have had a continuous difficult problem for many years.

MR. STEIN: Do your customers notify you of this?

MR. BROWN: They did for many years, but for some time we have been controlling it much better and just this past few months, since the completion and since the beginning of operation of these sewage treatment facilities, our water has greatly improved.

MR. STEIN: Thank you.

MR. KLASSEN: I might add that they not only in the past have notified Mr. Brown, but the State Health and Welfare Department.

While the problem at Chester was vividly described by Mr. Kittrell, I wonder if there is a representative here from the City of Chester, either its Mayor or its Water Superintendant, that would want to add anything to the statements that were made by Mr. Kittrell?

MR. WINGERTER: My name is Clayton Wingerter. I am Superintendant of the Chester Water Department.

Mr. Kittrell covered our situation pretty well. Our trouble started a good many years ago. Periodic taste trouble two years ago climaxed with a very high phenol content. And you asked if Mr. Brown was notified by his customers, we were emphatically notified because coffee and tea was out. There was only one place in town that found a secret of making coffee, and the people from their homes were going there to get coffee.

We had to go to the chlorine dioxide, which Mr. Brown said he used, which solved the problem, and we applied that to our filter effluent as it went into the clear well.

Occasionally the dairy was our chief objector. They would come down to check, and as they would come down, say, well, the river had cleared up, we would give them a sample out of our filter effluent, which is safe to drink because we carry a high chlorine content; you could see their hair almost stand on end from that phenol. It would actually burn your mouth, the phenol content was so high.

Another one of the problems we have is the grease. There's times if you look at our filter surface you wouldn't know whether it was a water filter or whether it was something in a well-run sewer plant, because it had curds of what appeared to be kitchen grease floating on the surface. It's covered.

The other thing we use, we use carbon to control the taste. Of course, we have a fairly good water now, and we get a little taste, we let slip through, why, we hear about it worse than before we started. Outside of that I don't -- well, yes, we do have a bacteria count which is terribly high at times. We go from 240 per 100 ml sample to 240 thousand or more. Now, those are the tests that are run at the state lab. We had any number of them which had 240 thousand or more coliform count and a hundred MF, and I have those records here as far back as I could secure reports, I have them here in a letter that I will leave with the conferees.

(Which said letter and tabulation are as follows:)

"Roland R. Cross, Director
Illinois Department of Public Health
Sanitary Water Board
Springfield, Illinois

"Subject: Mississippi River Pollution
Bi-State Agency

"Dear Sir:

"The City of Chester is presently programming to abate pollution of the Mississippi River caused by the discharge of untreated sewage wastes created in the City. It is recognized that by such abatement, the City is cooperating in protecting the raw water supply of downstream communities. At the same time we are very interested and concerned with progress being made by upstream communities to protect the only raw water supply available to this City. '

"For a number of years the City has been confronted with the problem of producing a finished water of good palatability. During the latter part of 1955 the odor and taste of the water was such that the people refused to use it for drinking purposes. Coffee, tea and other beverages prepared from the water was so unpalatable that even restaurants discontinued serving until the condition was corrected. The City installed a chlorine dioxide generator to oxidize the phenol. Chlorine dioxide was fed into the filter manifold at the point entering the clear well. The filtered water was good except for a strong phenol residual taste. Carbon is also used to increase the palatibility of the finished water.

"An excess of fatty waste present in the raw water coagulates on the filters increasing maintenance labor and costs.

"Attached is a tabulation showing the results of bacterial tests run by the Illinois Department of Public Health at the laboratory in Springfield, Illinois. The high coliform count is evidence of the problems faced by the City in producing water safe for public consumption.

"Very truly yours,

(Signed)

"C. L. WINGERTER
"C. L. Wingerter, Water Supt.

"CLW:ek"

"TABULATION OF BACTERIOLOGICAL TESTS

"PARTS PER 100 MILLILITERS

"TEST NO.	DATE	COLIFORM COUNT
	4-12-50	2,400
	6-14-50	240,000 or more
	12-11-50	2,400
	6-19-51	24,000
	12- 4-51	24,000
	1-13-53	2,400
	2-16-53	6,200
	3-10-53	24,000
	4- 7-53	24,000
	6-15-53	69,000
	7- 7-53	240,000 or more
	8-17-53	240,000 or more
	9-22-53	240,000
	11-16-53	24,000
	1-12-54	620
	2-23-54	69,000
	3- 9-54	6,200
	4- 6-54	240,000 or more
	5-11-54	240,000 or more
	6-15-54	240,000 or more
	7-27-54	240,000 or more
	8-17-54	2,400
	9-20-54	2,400
	10-12-54	240,000 or more
	11-16-54	69,000
	12- 7-54	13,000
	1-11-55	24,000
	2- 8-55	240,000 or more
	3-14-55	62,000
	4-14-55	240,000 or more
	5-10-55	240,000 or more
	6-21-55	69,000
	7-19-55	240,000
	8-15-55	24,000
	9-21-55	64
	10-11-55	240,000
	11- 8-55	69,000
	12- 6-55	5,000
	1-16-56	53
	3-12-56	62,000
	4-17-56	69,000

"TABULATION OF BACTERIOLOGICAL TESTS (Cont'd.)

"TEST NO.	DATE	COLIFORM COUNT
	6-11-56	240,000 or more
	7- 9-56	240,000 or more
	8-14-56	240,000 or more
	10- 8-56	240,000
	11-19-56	24,000
	12-17-56	24,000
	1- 2-57	240
	2-12-57	6,200
	3-12-57	9,500
	4-30-57	240,000 or more
	5-14-57	21,000
	6-18-57	240,000 or more
	7- 9-57	69,000
	8-12-57	62,000
	10-15-57	2,400
	11-13-57	240,000 or more"

MR. KLASSEN: Thank you, Mr. Wingerter.

Next we will have a statement from our State Department of Conservation by William J. Harth, Superintendent of Division of Fisheries.

Mr. Harth.

MR. HARTH: My name is William J. Harth, Fish Conservation Supervisor and Secretary-Treasurer of the Upper Mississippi Conservation Committee.

There is not one person here who can individually stand up and say "I have polluted the Mississippi River and in doing so, have impaired the quality of the water by this pollution, whether it be sewage, industrial waste, to such a degree as would adversely or unreasonably affect the water for various beneficial uses." Combined, we have reaked havoc in a pollutional way to the river and have done everything in the book - caused the loss of our sport and commercial fishery and impaired other recreational uses.

In the broad sense, we must realize the sport, commercial, recreational and other uses, including esthetic value of our fish and game and suitable habitat conditions to perpetuate and utilize to the fullest these renewable resources in proper relation to other interests. All too often, there has been too little consideration given to the effects on fish and wildlife aspects. Our natural renewable resources are valuable. Sport fishing exceeds any other sport. Angling is our nation's number one past time. More people participate in sport fishing than in the combined total of all sports, including all people involved in spectator sports such as baseball and football.

In the United States, we have a great many kinds of fresh-water fishes. In the U. S. we have upwards to 500 species while in Europe there are only 126 species. The State of Illinois alone has over 180 species.

Sport fishing for many is the refreshment and escape from pressures and hurry of everyday life. Who can measure the health and aesthetic value attendant upon the sport fishing pursuit. The angling habits seem to be conducive to long life. Izaak Walton lived to be 90 years old and leads a long list of celebrated fishermen who have lived to a ripe, active old age.

In 1955, the U. S. Fish and Wildlife Service conducted a statistical survey through the Crossley S-D Surveys, Incorporated of New York. From this survey, a publication entitled, "National Survey of Fishing and Hunting - 1955" was produced. Some of the findings are - one in every 3 (17,000,000) householders in the U. S. in 1955 had one or more fishermen or hunters. One in every 5 persons, age 12 and over, (25,000,000) fished or hunted in 1955. One in every 4 men fished. One in every 11 women fished. One in 5 men hunted. One in every 128 women hunted. About 18 percent of the population in the general area in which St. Louis is located that are over 12 years of age fished. Twenty-five million people over 12 years of age spent a lot of money fishing and hunting. Approximately 2,000,000,000 dollars was spent on fishing. About 1,000,000,000 dollars was on hunting. They spent the money on fishing tackle, rods and reels, hunting equipment, camping gear, automobile expense, food and lodging, dogs, boats, motors, and for various kinds of hunting and fishing licenses. This indicates in a conservative way the money value related to our natural renewable resources.

During the past two years, the Illinois Division of Fisheries has had a sport fishery investigation on the Mississippi River. One of the primary objectives of this project is to establish a value for the sport fishery for the entire river and for the various river pools. This sport value will be incorporated into an economic fishery report with our commercial fishery value expressed in dollars and cents which is based on individual catch statistics and value of equipment used to catch fish on the Mississippi River. It may be interesting to note from the Project's progress report that sport fishing from the mouth of the Missouri River to Cairo, Illinois is next to non-existent. This lack of angling in the lower section of the river is attributed directly to the effects of pollution in the Greater St. Louis area.

The Mississippi River Fisheries Investigation has submitted a pollution report of some length and adds to other studies of previous years regarding this serious pollution condition. Besides this, we have submitted statements from our various conservation officers (wardens), fisheries biologist and commercial fishermen. From firsthand field investigation, it was denoted specifically the misuse of the Mississippi River by various kinds of pollutants in the St. Louis - Alton area, and how it has affected the river downstream.

The total catch by Illinois commercial fishermen in 1956 for the 200-mile stretch from Alton to Cairo was 25,255 pounds worth $3,399.55 as compared to 2,284,909 pounds worth $367,626.80 caught by Illinois commercial fishermen in the 375-mile stretch from Alton to East Dubuque. In 1950, the catch was about 6-1/2 times greater in the Alton to Cairo stretch and worth five times as much as compared to the 1956 catch. From this, one can conclude that commercial fishing in the lower stretch of the Mississippi River bordering Illinois is almost non-existent. Only a few part-time fishermen try to operate in this area. It is next to impossible for anyone to make a living by commercial fishing on the lower reach of the Mississippi River because of its polluted condition.

We have also the Annual Proceedings of the meetings of the Upper Mississippi River Conservation Committee that follows through with information relative to pollution on the Mississippi River. On December 13, 1943, representatives of the Conservation agencies of Minnesota, Wisconsin, Iowa, Illinois and Missouri and the Fish and Wildlife Service along with cooperating agencies, Corps of Engineers and State and Federal Public Health Services, formed an association to provide for the carrying on of cooperative studies of national and interstate concern affecting conservation, fish and wildlife, and recreational interests in the Upper Mississippi River with the general objective of securing recognition of fish and wildlife and recreactional uses of the river together with navigation and other public uses in proportion to related public benefits.

From the U.M.R.C.C. Annual proceedings, pollution reports and commercial fisheries catch statistics, one can follow the decline in the river fishery in the Alton-St. Louis to Caruthersville, Missouri reach of the river. Actually the decline was in progress prior to the initial commercial fisheries reports of 1945. In the canalized section above the Alton Dam to East Dubuque, a distance of 375 miles, 3,096,476 pounds were taken in 1945 by Iowa, Missouri and Illinois commercial fishermen and in the lower uncanalized section of the river from the Alton Dam to Caruthersville, about 310 miles, 449,807 pounds of commercial fish were caught by Missouri and Illinois fishermen. In 1955, 5,371,243 pounds were taken in the upper section and 103,614 pounds were taken in the lower section.

Some ten years ago, in an interview with commercial fisherman near Cairo, I was trying to find out what primary fish was being taken by him on the Mississippi River at that time. The lower section of the river had been a famous producer of large catfish and other commercial species according to early records. As you probably well realize, fish have different names at different localities. Like my commercial fisherman friend described to me a fish I called it a flathead. In some localities they are known as Hoosiers and some place gujon. Finally the man said he knew the fish I described and he said, "Sure, we call them abolutions" and indicated that he had some of these fish in his live box. Upon actual inspection of these fish at the live box, I could certainly say they were abolutions. They were monstrosities as far as any flathead catfish that I had seen and showed direct evidence of the polluted condition of the Mississippi River. Many of you may remember the Tarzan serial in movie theatres some 20 to 30 years ago. At the beginning of the film, you could hear the resounding cry of 00000 -----aaaaaa, and we saw Tarzan swinging through the jungle on vines. He did finally come down and thumping his chest said in a loud voice "Me Tarzan - King of the Jungle." Recently as I was tip-toeing through my living room as my smallfry were watching television I heard the old cry. I looked, and, sure enough, it was like old times - Tarzan swinging on the vines through the jungle resounding 00000 ----aaaaaa. He was following the pattern. Suddenly as before he came down from the jungle canopy to the jungle floor. He thumped his chest and said "This is your jungle. Keep it clean." Similarly, we are more aware in this day of the importance of such things as water quality. It is hoped, and this is important, I feel sincerely that some fundamentals are not lost.

Theologians say one of the most important commandments is "Thou shalt love thy neighbor as thyself". It is desirable that if we are aware of something that should be corrected, we do not wait until "thyself" is affected.

MR. KLASSEN: Mr. Lifton will be our last person to speak. There's been much reference to boating, and I want to call on Mr. Fred B. Lifton, Legislator-Coordinator of the Outboard Boating Club of America to make a few statements.

Mr. Lifton.

MR. LIFTON: Mr. Chairman, members of the conference, my name is Fred B. Lifton. I'm with the Outboard Boating Club of America. We are a national organization representing the primary producers of outboard motors, outboard boats, boat trailers, and many boating accessories. We also have in our organization in excess of 20,000 individuals, ordinary people who just enjoy outboarding, who are either affiliated individually or through a club of some sort.

Mr. Chairman, I feel somewhat conspicuous in this very impressive gathering here this morning because I claim absolutely no expertness or any special knowledge of any kind about pollution. I suppose that if one were put in front of me I could identify a disposal plant, but I wouldn't try to do anything beyond that.

I think I can say, however, from being in this field for some time, that clean water is essential to the real enjoyment of recreational boating.

A great many statistics have been presented to you this morning about the growth of recreation, particularly fishing. I won't go into detail on that. I think it is self-evident. The remarkable thing has been the sudden spurt in the interest of pleasure boating in the past decade. Suffice it to say that in less than ten years the number of outboard motors in actual use has more than doubled, so that today it is around the five million mark. Today in this country we have in excess of six million pleasure boats in use, and in 1957 it is estimated that about thirty-five million Americans participated in this sport.

It has been mentioned that we are drifting away from the spectator, from the vicarious sports, into things which people can enjoy themselves. That is certainly true of fishing. It is also true of boating. Boating and fishing are often synonymous. Fishing is still the primary reason people buy boating equipment.

There is another trend in boating which I think has a connection to this particular meeting, and that is that pleasure boating today is for the most part family boating. It is an activity which the entire family can engage in. It has been a remarkable restraint upon juvenile delinquency. I don't think anyone is going to particularly enjoy taking his family, his very small children, his wife, upon polluted waters. There is nothing that so quickly drives the enjoyment of the open and of the water from you.

Until a few days ago my knowledge of the situation in and about the St. Louis area, so far as boating on the Mississippi was concerned, was admittedly based entirely upon hearsay evidence. Hearsay is ordinarily considered very bad, ordinarily is inadmissible in a court of law, but I had had a great deal of hearsay evidence presented to me, so I was beginning to think it had a great deal of credence, because it came from diverse sources, and it was never contradicted, and it always said that boating around here was pretty miserable. There was just no other way to describe it.

Several days ago I had the opportunity of getting on the river myself, making the type of gross examination that Mr. Poston referred to in his opening remarks, and I'm not sure I have completely recovered from it yet. I have been around the country, I have seen a great many boating waters, but I can honestly say I have never seen anything approaching the situation that prevails here.

Now, I'm not from this area, I'm from Chicago now, I didn't come down here to try to tell anybody what to do, how to do it or when to do it. All I hope to do is to try to add one small voice, some sentiment to the idea of doing something.

Now, again, I say I am not an expert, but in this gross examination, this trip up the Mississippi in the St. Louis area that we made up and down, I had some other people with me who have been in the conservation field, in the boating field for many, many years. Literally scores of experience were represented there, people from all parts of the country, and to a man, these individuals were literally astounded at what they saw. The only comment was one that you have heard many times, and that is, "It's perhaps a shame that the river wasn't just a wee bit thicker, then you could plow it." The potential recreational activity that you could have literally at your doorstep here, I think it just can't be measured today. We get some reports as to people who would like to use this area for recreational activity, and not only can you measure this in the advantages to the people, in the recreation that they will gain thereby, but there are also very obvious economic implications when you can foster a thriving recreational business in your area. It has been big business in many other parts of the country, and considering it today, I can indicate what the size of that business is by saying that the '57 figures show that pleasure boating and its allied activities in 1957 was a one and one-quarter billion dollar industry.

This is somewhat of a strange twist for me, a little ironical for me to be here, because usually I have a situation the other way around. We have often been called in to areas where somebody has said "Recreational boating is polluting the waters. The waters were clean before you came here." This usually comes from heavily congested inland lakes about some metropolitan center, an area where there is an extraordinary amount of boating and other activity going on, really too much for the particular body of water to sustain, and often where there isn't too much flowage of water, and where the shoreline is highly developed, and the riparian owners are sometimes disturbed by certain evidences which they find on Monday morning.

We are entirely sympathetic with these demands to cure this pollution. We are cooperating with many different groups working on it. Industries, both outboard and inboard, have had technical groups working on it for some years. Just within the past two months one major manufacturer announced a new device which is inexpensive and which will entirely eliminate any boat pollution from most pleasure craft, and the few remaining varieties of craft that this won't fit are being studied today. Model legislation has been prepared and is fostered in many states, but

I can honestly say after having been out on the Mississippi in this area that that particular problem which has concerned us in the past looks awfully small in comparison.

When I got off the boat the other day and we were disembarking with our party, we were approached by several rather hardbitten individuals who had been in the business of operating mariners and docks for a number of years, the type of individual that I have encountered before. He doesn't have a particular affinity towards government, shall we say. He would be rather caustic in his remarks as to about what the government can do or should do, rather crusty people, and these individuals, when they found that we were involved in looking at pollution, came up and in the most imploring way, it surprised me because I have never had an individual of this sort come up to me in this manner before, and he literally implored me to do something. Now, he didn't know what to do, but he just pointed to the river and he said, "It's terrible. It can't go on much longer like this. Please, can't you do something?"

And that, gentlemen, is all I am here to ask you today, is to do something.

Thank you very much.

MR. KLASSEN: Thank you, Mr. Lifton.

That concludes, Mr. Chairman, what I wanted to present. I merely wanted for the purpose of the record to recognize Dr. Starrett from our Illinois Natural History Survey, who is here, but will not make a statement.

MR. STEIN: Thank you.

At this point we would like to call on Mr. Happy of Missouri.

MR. HAPPY: Mr. Chairman, I shall ask Mr. J. K. Smith of the Division of Health to prevent the statement of our agency in regard to the occurrence of pollution.

Mr. Smith.

MR. SMITH: The Missouri Division of Health has been active in the field of water pollution control for the past three decades. In the past, the Division has been limited to the investigation and control of water pollution as it affects public health and the sources of public water supplies. In carrying out this purpose the Division has been successful in protecting water resources for other water uses such as industrial, recreational, agricultural and wildlife. The Division operates under the general provisions of the Statutes of Missouri, described in Section 192.020, Revised Statutes of Missouri, 1949, with cumulative Supplements, and under regulatory authority vested in the Division by the Constitution of Missouri. Because of the broad responsibilities in the water pollution control field, the Division of Health was designated as the official water pollution control agency for the State of Missouri by Gubernatorial proclamation in 1948.

The Division of Health has cooperated with other state water pollution control agencies and the U.S. Public Health Service in completing studies and initiating abatement programs on the Missouri River, the Mississippi River and on streams within the state boundaries. In brief, progress has been encouraging. Activity toward abatement works has been inaugurated by all but a few of the smaller communities contributing to pollution. As an example of some of the activity, St. Charles has an engineering report and will hold a bond election April 1, 1958 to finance trunk sewers and treatment works for sewers tributary to the Mississippi River. This program will remove some of the sewage presently pumped to the Missouri River. Louisiana has completed an engineering study for sewage treatment works. The city has funds available and as soon as a federal grant can be obtained will proceed with construction. Canton has retained an engineer who is currently preparing an engineering report. Hannibal constructed primary sewage treatment work in 1940. Portage Des Sioux, a very small community near here, constructed primary sewage treatment works in 1957. O'Fallon completed adequate sewage treatment works in 1957. Engineering reports have been approved for Valley Park, Ellisville, DeSoto, Festus, Crystal City, Flat River, and Elvins. Desloge will award contracts for construction of needed sewage treatment works in the near future. Cape Girardeau has employed an engineer who is currently preparing an engineering report and cost estimates.

An engineering report and cost estimate for trunk sewer and complete sewage treatment work serving Coldwater Creek, in the Metropolitan St. Louis sewer district, has been approved by the Division of Health. We are advised that a bond election will be held in the near future. Cowmire Creek complete sewage treatment plant was placed in operation in 1957. Some inactive communities are understandably biding time until action is apparent in the Metropolitan St. Louis area.

Under provisions of Public Law 845, the Bi-State Development Agency was granted funds to conduct a study of water pollution in the Mississippi River, Metropolitan St. Louis area in the fall of 1950. Sampling programs were started in January, 1951, and continued until December, 1952. The water pollution control agencies of the States of Missouri and Illinois, with the Public Health Service, assisted in collecting data and analyzing results. Findings, including data, conclusions and recommendations, were published in 1954.

Recent review of this data reveals that the quantity, character and source of pollution contributed from the Missouri side of the river has changed but little. As a result of waste survey reports to industry, several improvements have been made through process changes and in several instances major in-plant waste studies have been started. Several contributors to pollution have gone out of business or relocated. To offset these improvements, the population of St. Louis County has continued to increase. The population of St Louis County has continued to increase. The population of the county has been increasingly served by sewers, and in most instances primary treatment is provided before discharge to drainage courses or trunk sewers Several sewage treatment plants have been abandoned with the construction of trunk and interceptor sewers. The metropolitan district is presently providing operation for approximately 70 sewage treatment plants. There are still over 90 small sewage systems, including plants, which have not been dedicated to the district for various reasons Nearly all of the treatment facilities, serving a total of 150 000 persons are overloaded and observations reveal that from 25 percent to 50 percent of the sewage collected is by-passed raw to the streams and eventually the Missouri or Mississippi Rivers. The effect of this recent pollution exceeds the industrial improvements and reductions in waste discharge with the result that organic wastes of 3.8 million population equivalent is discharged in a manner or location that affects present water uses and seriously affects potential water uses in the St. Louis reaches of the Mississippi River. Of this total pollutional load, 250,000 population equivalents, is attributable to ground garbage discharged through Metropolitan St. Louis district sewers. A large portion of complaints on Lower Mississippi River pollution have been the result of visible evidence of this discharge garbage Additional pollution, chemical in nature, is known to exist. Limitations of funds and personnel have prevented complete investigation of the effects of this pollution. However, further investigation and studies are expected to establish the extent and nature of this type of pollution

On several occasions industry, seeking location in the Midwest, has advised the Division of Health that sites below the City of St. Louis could not be considered due to undesirable impurities in water taken from the Mississippi Trace impurities affecting certain processes often dictate selection of industrial plant locations

The water plant serving Cape Girardeau has experienced some difficulty with taste and odor problems. Additional chemicals are required for treatment because of excessive pollution in the river.

There is a practical limit to which water containing pollution can be treated and made potable. Some of the wastes presently discharged from the St. Louis area are not removed by known water treatment processes Increases in the discharge of untreated wastes will seriously affect the use of the Mississippi River as a raw water source

MR. STEIN: Thank you, Mr. Smith. Would you wait there, if anyone has any questions.

Mr. Poston?

MR. POSTON: No.

MR. STEIN: Mr. Happy?

MR. HAPPY: No.

MR. STEIN: I would like to ask you a question, Mr. Smith.

Talking in terms of this ground garbage, does that come from home garbage grinders?

MR. SMITH: No, that comes from the some 280 tons of ground garbage disposed of by the City of St. Louis.

MR. STEIN: Where does the city have it? They have garbage collection, grind it and put it into the sewers?

MR. SMITH: Yes.

MR. STEIN: Thank you.

Mr. Happy, would you continue?

MR. HAPPY: Yes, Mr. Chairman.

I would like to call on Colonel Schweizer, the District Engineer, to present a statement for the U. S. Army Engineer District of St. Louis.

COLONEL SCHWEIZER: I don't know about you all, but it looks to me like since we've been sitting for about two hours and the Chairman says you all can stand up and shake yourself for a minute, it might be a good time to do it.

(Short recess.)

MR. STEIN: Colonel?

COLONEL SCHWEIZER: Mr. Chairman, ladies and gentlemen, good morning.

The U. S. Army Engineers are very very happy to be able to cooperate with the Public Health Service and the other agencies here in Metropolitan St. Louis in its effort to relieve this particular problem of pollution of the rivers. We were happy to provide the boat that several members of the committee used when they made a trip up and down the river. We'll be happy to do that again any time we don't either have ice in the river or low water, one or the other. We don't want you to get caught on one of these bars with all of this phenol and other stuff we've been hearing about.

We have also supplied quite a bit of information on stages and other things in the river to the committee, and, as I said, anything that we can do in this particular problem, why, we are happy to do it.

It has been our observation that the remarks that Mr. Kittrell made earlier this morning are very very true. We have observed the same situations and I don't care -- I don't feel that it is appropriate to repeat what he said, so I will just say amen to what he has already covered.

One thing that has not been brought up so far, and I believe is of particular interest, is the fact that there are two authorized flood protection projects on which preconstruction planning is currently underway in our office. These projects are the flood control project for St. Louis, Missouri, and the one for Alton, Illinois. In general, both of these projects provide for handling of interior drainage during high Mississippi River stages by pressure sewers and pumping.

No corrective measures, and I would like to repeat this again, no corrective measures for pollution control are included in this project plans authorized by Congress.

Installation of sewage treatment measures would be the responsibility of local interests, that is, the citizens of St. Louis and the citizens of Alton.

Now, planning is well advanced on the City of St. Louis project, and should appropriations be made available in this fiscal year this coming fiscal year, initiation of the first item of construction should be started during the latter part of March, 1959.

Development for plans for abating pollution should, therefore be given immediate consideration in order that any additional remedial work may be properly coordinated with the flood control planning for sewers and pumping stations.

As all of you engineers here know, when you have to go back and redesign or if you are going to start in tearing up levees, flood walls that have just been built, it's a very very expensive proposition and I would certainly like to urge that here we are in the process of planning a flood control project for St. Louis, and that we get together and all of these things be worked out ahead of time, which will certainly reduce the overall cost to both agencies concerned.

Now, the Illinois Sanitary Water Board has issued a directive, and the City of Alton is preparing an engineering study on possible means to eliminate pollution. Necessary facilities, including a sewage disposal plant, should be coordinated with the plan of improvement for flood control proposed for this area.

Now, the plans at Alton have not progressed to the stage yet where our detailed planning on this flood wall is in progress. It is dependent upon participation by local interests, and the sewer project I believe, is tied in to this particular thing. It is certainly essential that it all be worked out together again to reduce the over-all cost to the citizens concerned.

I would like to point out that here, as in every case, the cost of any modifications in such plans or plan, due to sewage treatment, is the responsibility of the local interest, and the Federal Government will not be able to assume very much of the cost of the actual happening.

Now, along the East Side, the industrial areas are presently afforded protection by a system of levees. The raising of the levee grades to provide the authorized degree of protection is principally underway. While the plans include necessary alteration to existing pumping plants and construction of new pumping plants where deemed warranted, the existing authorization does not include provisions for sewage treatment.

Planning for sewage treatment in these additional areas should also be coordinated with the plans for pumping station alterations. If we can use these pumping plants when the river is not high to pump out treated sewage, it will certainly reduce the over-all costs, because you don't need to have one set of pumps for pumping water during the time that the Mississippi River is high and another set of pumps to pump the sewage under normal circumstances.

Now, again, and this is something I have to keep bringing up, but it is most important, cost of any modifications due to sewage treatment would be the responsibility of local interests.

Gentlemen, I am very happy to be here. I want you to know that the U. S. Army Engineer District at St. Louis will be happy to do anything that they can to assist in this particular program, and I again offer you the services of our boat if you want to take a ride up and down and look at the sewers.

Now, does anybody have any questions?

MR. STEIN: Do you, Mr. Klassen?

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MR. KLASSEN: No.

MR. STEIN: Mr. Poston?

MR. POSTON: Do you have one date, 1959, to start your construction on your levee projects? Is that both sides of the river?

COLONEL SCHWEIZER: No, sir, the levee construction on the East Side is underway in some cases and will continue, has been underway in some cases and will continue for several more years. For example, we are raising the levee, planning on beginning our 52-foot levee raise in the Wood River area this coming year.

Isn't that right, Mr. Stevens?

MR. STEVENS: Yes.

COLONEL SCHWEIZER: We are already working down in the Monsanto area, as Mayor Leo Saujet will note. We have been out talking to him about it, in that we are building a concrete wall there. We are working, I think we have some four pumping plants to either be put in or enlarged over in the East St. Louis area. Two of those, I think, are to begin some time next year. We are in the process of designing those plants right now.

Now, in the St. Louis area, providing the Congress will give us the necessary appropriations, we plan on starting levee construction in March, 1959 in the Maline -- I guess that is right -- Maline Creek area up near the Chain of Rocks Water Plant and working south. We will put in about some two and a half miles of levee, but at the same time we are working right now in the St. Louis area on designing our pumping plants, and it will be a great thing if the City Metropolitan Sewer District of the City of St. Louis and the Army Engineers could all get together so that we could eliminate any duplicate features, and that these pumping plants could be made big enough to handle the load it will eventually handle.

Again, of course, the difference between what the Federal Government is going to put up for what it figures the pump should handle, and the final load is going to have to be paid for by the local interests concerned.

MR. POSTON: Thank you.

MR. STEIN: Mr. Happy?

MR. HAPPY: No questions. Thank you very much.

As the final statement by the State of Missouri in regard to the occurrence and effect of pollution, I should like to call upon Mr. T. J. Barnickol, representing the Missouri Conservation Commission.

Mr. Barnickol

MR. BARNICKOL: Mr. Chairman, ladies and gentlemen, this is a statement prepared by the Missouri Conservation Commission relative to pollution in the Mississippi River at and downstream from the St. Louis area.

Pollution in the Mississippi River downstream from St. Louis has been a subject of consideration by the Missouri Conservation Commission since it was organized in 1937. Before that time the condition of this section of the Mississippi was investigated by the U. S. Bureau of Fisheries, now the U. S. Fish and Wildlife Service, and since 1944 there have been several investigations by state, federal and other agencies all of which dwell upon the contaminated condition of the river below St. Louis. The Conservation Commission has participated actively in some of this work and has made investigations of its own upon the relationship between this pollution and the sport and commercial fishery.

The objective of the Conservation Commission is to protect the fish and wildlife resource and under sound management to provide for the greatest use of this resource by the people of Missouri. Pursuant to this objective, the Commission functions under the Wildlife and Forestry Act of Missouri.

In 1944 this department participated in a study of the Mississippi River fishery conducted by the Upper Mississippi River Conservation Committee. That, too, has been referred to previously. This organization, which continued to be active, consists of representatives of conservation and public health agencies in Missouri, Illinois Iowa, Wisconsin and Minnesota and of representation from the U. S. Fish and Wildlife Service. Initially its work consisted of a pollution survey and a fisheries' investigation. The former was conducted by the U. S. Fish and Wildlife Service between Caruthersville, Missouri, and the Hastings Pool in Minnesota in 1944. The fisheries' investigation was conducted cooperatively by neighboring states for which the Mississippi forms a common boundary. This work was begun in 1944 and during its first year covered the river between Caruthersville, Missouri, and Keokuk, Iowa. Later the fishery work was extended upstream. The results of this survey were published in 1951 in a bulletin of the Illinois Natural History Survey entitled Commercial and Sport Fishes of the Mississippi River between Caruthersville, Missouri, and Dubuque, Iowa, by your speaker and William C. Starrett.

This work, which consisted of a fish sampling operation, was designed to take all kinds of fish. It was conducted at numerous test stations, nine of which were downstream from St. Louis. A station at Caruthersville, roughly 298 miles below St. Louis, was the farthest downstream. The results of fish sampling in this reach of the river showed a marked deterioration of the sport fishery. On the basis of the quantity caught, we believe that sport species decreased and that the non-game fish increased progressively from Caruthersville to St. Louis. At Caruthersville, for example, 11 percent by weight of all fish caught were sport fishes which include bass, crappies, sauger and others. The proportion of these fishes in the test net catches decreased at upstream stations to Cliff Cave, Missouri, where none at all were taken. Cliff Cave is located about 13 miles downstream from St. Louis. There was one other location at which no sport fishes were taken. This was at Cape Girardeau, Missouri, roughly 128 miles downstream from St. Louis. At a station upstream from St. Louis, but below the confluence of the Missouri River, sport fishes comprised slightly over one percent of the catch. At another station between the Missouri River and Lock and Dam No. 26, which was upstream and on the Missouri side away from intense pollution, the relative amounts of these fishes showed a marked increase. Here sport fishes made up 17 percent of the test survey catch.

The quantity of commercial or non-game fishes taken in the test-net survey between Caruthersville and St. Louis was just the opposite. These species increased as the sport fishes diminished. The total weight of commercial species in the catch increased from 35 percent of the total at Caruthersville to 92 percent at Crystal City and 96 percent at Cliff Cave. Commercial fishes decreased to 94 percent of the catch at the station located below the confluence of the Missouri and to 72 percent at the next station upstream. The progressive increase for the commercial group results principally from a marked increase in carp which are known to be more tolerant than sport species and many other commercial fishes. Flathead catfish tended to follow a pattern similar to that of carp. The values for sport and commercial fishes are based upon the catch of roughly 7,600 pounds of fish between Caruthersville and the location above the confluence with the Missouri River.

It seems significant also that more carp and fewer sport fishes were caught in the Mississippi above the mouth of the Ohio River than at either of two stations below the confluence of these streams. This seems to demonstrate that these peculiarities are associated with the Mississippi River above its confluence with the Ohio. Below the Ohio River, we found more sport fish and fewer carp than we found above. We also found a greater variety of both sport and non-game species between Cairo, Illinois and Caruthersville than we did between Cairo and St. Louis. These fish populations assume a pattern which biological indicators of pollution almost always follow. As conditions become less favorable, the variety tends to diminish, while the quantity of more tolerant forms increases. This was true also of other indicator forms studied by the Bi-State Development Agency and reported in its publication entitled "Mississippi River Water Pollution Investigation: St. Louis Metropolitan Area" issued in 1954.

The fishery survey was conducted largely during a period of high volume of flow, but even under this condition fishermen at Ste. Genevieve, Crystal City and Cliff Cave reported that fish which they caught often had an oily, gassy or medicinal flavor and odor. They believe, however, that this off-flavor was more prevalent during period of lower flow than that which prevailed during the fisheries investigation at these stations. The fishery survey nets operated at Crystal City showed marked evidence of pollution and at Cliff Cave they became so heavily clogged within a few hours that large anchors used to hold them in place often failed where nets were set in moderate current. Often it was difficult for two men to lift a net into a boat because of the weight of accumulated material. Without having seen this condition it is hard to believe that a natural water course could become so filthy and that it could carry so much solid organic material. The test nets and other fishing devices used became clogged with masses of paper, garbage, and other components of untreated sewage. The odor could hardly be tolerated.

Without further explanation the increases of carp described here might be interpreted as an advantage to the commercial fishery, but this is not true. The off-taste and odor in fish has become a major fishery problem since 1944. By 1946 similar reports came from Chester, Illinois, fisherman and since then these reports of off-flavor and odor have come from fishermen throughout the Missouri section of Mississippi River below St. Louis - a distance of approximately 316 miles. A Festus, Missouri, fisherman reported having to discard a 3,000-pound catch of fish taken near Herculaneum because of the bad odor and flavor. In 1947 commercial fishermen at Valmeyer, Illinois, 28 miles below St. Louis reported that often half their catches of fish were discarded because of an off-flavor resulting from pollution. Another fisherman at Kimmswick in 1953 reported that 90 percent of his catch was not marketable as a result of the taste and odor problem. In 1957 a fisherman in Mississippi County, Missouri, which is opposite Cairo, Illinois, reported the total loss of 400 pounds of buffalo fish taken in one haul in a chute of the river. These fish he said were so badly contaminated with a foreign odor and off-flavor that they could not be marketed. Similar reports from fishermen in Tennessee prompted the Department of Conservation in that state in 1954 to inquire into the matter and to prefer complaint with the Missouri Conservation Commission.

Fish market operators along the Mississippi are buying fresh fish from sources other than the Mississippi River. They are doing this to avoid handling fish with an off-flavor. Some fishermen report losing regular customers despite the fact that they have refunded money or replaced bad-tasting fish. Others report that once a customer has the experience of getting such fish, he refuses to buy more fish from the Mississippi River. For this reason market men at Caruthersville, New Madrid and other downstream cities are buying fish caught in the Tennessee River. Formerly a knowledge of the fact that fish come from the Mississippi River had marked sales appeal, but now in the lower Missouri section of the river this seems to be something to hide.

Since 1944 the Conservation Commission has record of 102 separate reports from fishermen relative to the polluted condition of the river. Of these, 96 reported the presence of oil on the water or an off-taste in fish, and those within a 30-mile reach of St. Louis reported interference with the operation of their fishing equipment by a heavy deposit of organic matter. At Ste. Genevieve, roughly 50 miles downstream, both law enforcement personnel with Conservation Commission and fishermen complain of heavy black oil which clings to their boats and other equipment. The occurrence of oil is discussed in the Bi-State Report, and in that study samples of bottom mud showed heavy deposits of oil and grease below Wood River and at five downstream locations to Wagner's Landing, 83 miles below St. Louis. Generally, fishermen believe that the off-taste in fish becomes more pronounced when the river is low. This coincides with the findings of the Bi-State study in which phenols were found near their maximum level during low water. It is known that phenols, or phenol-like compounds, which result from certain kinds of industrial contamination impart flavor to fish. The concentration of phenols in the water at which this can occur are so low that their values are expressed in parts per billion. Observations made on phenol concentrations in the Mississippi and taste tests involving contaminated water and fish are discussed in the Bi-State Report.

One of the Commission's law enforcement officers reported the occurrence of offal from a poultry processing industry whose sewer effluent enters the river in the St. Louis area on the Illinois side. He explained that the river current carries this material for some distance and that in places it becomes so thick at the surface that to drive a motor boat through it is nearly impossible. Feathers and decomposing viscera, presumably from poultry, comprised the major part of this waste. Poultry wastes were mentioned also in the Bi-State Report in which it is said that feathers and what were believed to be bits of fat were dredged up with samples of bottom mud taken at each of seven sample stations below St. Louis. The station farthest downstream at which this was found was at Bee's Bluff located 114 miles below St. Louis.

In addition to many records of off-taste and of other observations on the effect of pollution in the river below St. Louis, there also were five incidents of fish kill. These involved buffalo and catfish. The cause of these could not be determined, but two of them seem to have been associated with large quantities of oil in the water while another may have resulted from low oxygen. At one time in 1948 two fishermen at Ste. Genevieve reported having seen a few dead fish floating by every day.

The condition of the river described here has brought about a marked decline in the number of commercial fishermen who obtain permits to fish below St. Louis. Excluding St. Louis County but beginning in Jefferson, Ste. Genevieve, Perry and Cape Girardeau Counties in Missouri there has been a decrease of 64 percent in the number of licensed commercial fishermen from 1947 to 1956. It is true that commercial fishing has declined generally since World War II, but for the remainder of the river on the Missouri side the decline during that time has been only 12 percent. Most of the fishermen who continue to fish in this reach of the Mississippi have small amounts of fishing gear and they divide their time between fishing and other employment. Catching fish and marketing them often is done by the same person, and we find further downstream that many have discontinued fishing, but that they still operate markets and sell fish obtained away from the polluted area of the Mississippi River.

The commercial catch of fish from the Mississippi River bwtween Keokuk and the Missouri-Arkansas State line varied from 0.6 million to 1.7 million pounds from 1947 to 1956. Although this shows a considerable variation, the catch ran over a million pounds per year for eight of the ten years since 1947. These values represent the total catch over a 500-mile reach of the river for Illinois and Missouri. They are compiled from reports collected by the Illinois and Missouri conservation agencies as part of the work of the Upper Mississippi River Conservation Committee. From Alton, Illinois to the Missouri-Arkansas line, a distance of 339 miles, the yield was markedly less than it was from Alton to Keokuk, a distance of only 161 miles. In fact the catch for the upper reach averaged over a million pounds per year while that for the lower 339 mile section averaged only about 190,000 pounds. Finally, we find that the 339-mile reach of river below Alton averaged less than half of the catch for navigation Pool No. 26 which extends only 38 miles above Lock and Dam No. 26 at Alton. In making these comparisons we recognize some difference in habitat between the impounded section of the river between Alton and Keokuk and the unimpounded section below the Alton Dam, but we believe that the values stated far surpass the influence of the habitat difference. We believe, therefore, that the lower yield of the downstream section can be associated with the influence of pollution. The values reviewed here are shown in tabular form.

The catch of fish in pounds by Illinois and Missouri commercial fishermen for three sections of the Mississippi River, 1947 - 1956.

	Upper section (Keokuk to Missouri-Arkansas line.)	Pool 26 (38 miles)	Lower section (Alton Dam to Arkansas-Missouri State line.)
1947	977,625	198,878	330,888
1948	1,023,500	318,600	283,800
1949	1,537,971	712,537	274,394
1950	1,511,131	670,800	277,678
1951	1,336,415	519,442	190,688
1952	623,263	275,520	159,216
1953	1,133,282	219,861	140,472
1954	1,284,279	493,986	77,611
1955	1,689,943	582,053	103,614
1956	1,188,531	232,480	61,627
Average catch per year for 10 years	1,230,594	422,415	189,998

Some sport fishermen accustomed to fishing in the Mississippi River below St. Louis protest this situation in repeated correspondence with the Conservation Commission. Many of them, however, seem to be seeking recreation elsewhere. The Commission's law enforcement officers who are familiar with the Mississippi between St. Louis and Cairo report that the use of the river by sport fishermen has declined markedly in recent years. These observations are in agreement with an aerial count of sport fishermen made by the Upper Mississippi River Conservation Committee between Keokuk and Cairo on Memorial Day holiday, 1956. During that flight, 811 sport fishermen were counted in 162 miles of river between Keokuk and Lock and Dam No. 26 at Alton. Then in the short six mile reach between the Alton Dam and the mouth of the Missouri River, observers counted 111 fishermen. Nearly all of these anglers were counted just below the Alton Dam. The contrast between these values and the number of sport fishermen counted in the downstream section of the river is striking. In the Missouri River - Cairo reach of the Mississippi, which covers 195 miles, observers counted only 81 fishermen. On four flights made in 1956 between the Missouri River confluence and either Cairo or Caruthersville, the number of anglers averaged only 34 per flight. However, in eleven flights made this year in the Keokuk - Alton reach, the number of fishermen averaged 329 per flight, and in the little section between the Alton Dam and the Missouri River they averaged 95 per flight. Judging from these observations and from comment from sport fishermen, we believe that there is relatively little use of the river by sport fishermen between St. Louis and

Caruthersville, and we believe that this is associated for one reason or another with pollution.

At Ste. Genevieve a sportsmen's club was organized partly for the purpose of seeking a means of pollution abatement, and we are told that some of the service clubs have included seeking pollution abatement in the Mississippi among their club projects. Presumably local businessmen realize a considerable amount of business from sport fishermen who were attracted to the Mississippi, and since this activity has diminished they are seeking means of restoring it.

The Conservation Commission's waterfowl specialist tells us that migratory water birds seem to shun a section of Mississippi River downstream from St. Louis. Occasional counts of the number of waterfowl on the river between the Iowa and Arkansas State lines were made between 1936 and 1955. These observations, made from the air, show that for many years there has not been a measurable number of migratory birds in the reach of river from St. Louis to Ste. Genevieve. He says that pollution in this section of the river seems "chronic", and there are so few birds that waterfowl observers often tend to skip over this area unless they are warned to do otherwise. He mentions repeated observations of oil slicks on the water, and he says that waterfowl specialists observed thick bubbly oil on the surface of the water and small boils of a black oily substance in the faster current of the river. The latter observations were made from the shore or from boats. Oil is particularly harmful to waterfowl because their feathers become saturated with it and the birds cannot fly.

In conclusion we believe that the values reported here demonstrate a marked effect upon fish and waterfowl in the Mississippi River downstream from the St. Louis area. It is a damaging effect and it results from untreated industrial and sanitary wastes which reach the river in this area. This is a condition which nature cannot correct quickly. Speaking conservatively, its influence has reached several hundred miles. To make this great stream a virtual sewer represents a denial of a public right. It denies the right of all of the people to use it for fishing, hunting, other forms of recreation, for food production and other uses. When the knowledge of this situation is brought to the attention of the citizens and industries in the area, we believe that they will not condone pollution in the Mississippi River any more than they would consider fouling their own premises.

With the much talked about shorter work week, and in view of a rapidly expanding population, the value of water as a means of recreation is becoming increasingly important. The Mississippi River means much for many citizens of this community who are not accustomed to going further in search of outdoor recreation.

The day when our population level will demand added sources of food may be closer than we realize. In fact, the fishery resource of the Mississippi River demonstrated its food producing potential during World War II when the reach from its source to Caruthersville yielded an estimated 14.5 million pounds of food per year. Now Civilian Defense is studying sources of inland food supply which could be used on a survival basis in the event of nuclear attack. Under these conditions, Missouri's two large rivers are its largest source of fishery products on a mass production basis.

Clean water is needed not only for providing recreation and producing food, but it is essential for other public uses and for industry whose demands are increasing. The drought which may now be passing has taught us a dear lesson. Fresh water is not as plentiful as we once thought.

Thank you, sir.

MR. STEIN: Do you have any questions, Mr. Klassen?

MR. KLASSEN: No.

MR. STEIN: Mr. Poston?

MR. POSTON: No.

MR. STEIN: Mr. Kinsey?

MR. KINSEY: No.

MR. HAPPY: Thank you very much, Mr. Barnickol.

MR. STEIN: At this point, I think we will move on to the next portion of the agenda, which deals with adequacy of measures taken toward abatement and nature of the delays. Again we will call on Mr. Klassen. I would like to emphasize in order to conclude our business today we will have to limit presentations by folks who may be called by Mr. Klassen to no longer than five minutes. However, if you have a longer statement, we shall be happy to include that statement in the record.

Mr. Klassen.

MR. KLASSEN: Mr. Chairman, ladies and gentlemen, this interesting and important phase of our presentation will be made by Mr. Carl D. Gross, our Engineer of Special Projects, who has been intimately close to this situation in this area for many years, and is in immediate charge of the activities of these crucial problems in this area.

Mr. Gross.

MR. GROSS: Ladies and gentlemen, it is not necessary today to add that sneaky and insinuating "and others".

Representatives of the Illinois Sanitary Water Board conferred with industrial and municipal officials during the last three decades relative to the more serious aspects of the Mississippi River pollution, such as severe tastes and odors, excessive oil and other floating material. Industrial planning, expenditures and waste collection and waste treatment equipment resulting did effect some but not sufficient abatement of pollution. Contact with pollution contributing and water using agencies was obviously effected during the cooperative survey by the Bi-State Development Agency, U. S. Public Health Service, and the States of Missouri and Illinois, 1951-52. The published report including findings and recommendations, entitled "Bi-State Development Agency, Mississippi River Water Pollution Investigation, St. Louis Metropolitan Area," was made available to municipalities and major industries, August, 1955.

Conferences, correspondence and periodic sample collection with analytical procedures and submittal of operating data summaries were of value in the furthering of industrial waste reduction and pollution abatement. Question-and-answer meetings were held at evening assemblages of Manufacturers Associations in East St. Louis, September 17, 1956 and at Granite City, January 30, 1957. Letters from the Illinois Sanitary Water Board were sent June 11 and July 27, 1956 to individual municipalities and major industries advising them that any conferences desired by them would be scheduled at their convenience. These letters also reminded the industries and municipalities of the time schedule for abatement of pollution which was established by the Advisory Committee on Mississippi River pollution abatement at its July 17, 1956 meeting and which is as follows:

1. Commence engineering studies by November 1, 1956.
2. Submit engineering report by July 1, 1957.
3. Arrange financing and submit construction plans by January 1, 1959.
4. Start construction by July 1, 1959.
5. Place in operation by December 31, 1961.

Conferences with individual municipalities and major industries were held when requested and as staff and time schedules permitted, during 1957 and early 1958. As of March 1, 1958, the known progress status of certain Illinois industries and municipalities is presented in the appended Table 1.

The appended table will not be read.

(Which said table is as follows.)

Mr. Gross'

TABLE 1

MISSISSIPPI RIVER POLLUTION ABATEMENT STATUS - ILLINOIS SIDE
(A Partial Summary)

Name and Location	Approx. River Mile	Pop. Equiv. Discharged, 1954 report basis	Known, not necessarily actual status, March 1, 1958
Alton (c)		30,000	Engrs. report complete. Plant site obtained.
Piasa St. Sew.	202.4	24,400	Could be combined with Alton City.
Shields Br. Sew.	201.7	24,000	Could be combined with Alton City.
Alton Box Bd. Co.	201.0	235,000	Survey comp. Pilot opr. pt. closed stm.
East Alton (c)	199.5	7,300	Cons. engineer retained.
Wood River (c)	198.1	10,200	Selecting engineers.
Std. Oil Co.	198.1	**50,000	Oxidation lagoons completed 1957.
Shell Oil Co.	197.5	**100,000	Diffused air basins & Trick. Filter, '57.
Sinclair Refining	197.3	**20,000	Oxidation lagoons completed 1956.
Roxana (v)	197.1	1,900	Cons. eng. retained.
Hartford (v)	197.1	2,000	Ready to take bids. Bond issue passed.
Int. Shoe Co.	197.5	6,600	Two lagoons. Primary sed.
Granite City (c)	184.0	321,000	No progress. In E.S.L. & S.D.
Union Starch & Ref.Co.		in above	Surge tanks installed, filter to be.
Madison (c)	183.2	11,100	No progress. In E.S.L. & S.D.
Venice (c)	182.7	6,200	No progress. In E.S.L. & S.D.
*E. Side Levee & S.D.	180.6	438,000	No progress.
Monsanto (v)	178.1	**180,500	Eng. retained. Progress by Monsanto Chemical Co.
Dupo (c)	173.6	2,200	Eng. retained.
Columbia (c)	160.0	2,000	Eng. retained.
Chester (c)	109.5	5,300	Eng. retained.
		1,477,700	

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*Includes a number of municipalities, many small and a few large industries.

**B.O.D. data upon which population equivalent is based is not considered completely accurate due to interference of chemical wastes present.

MR. GROSS: Are there any questions?

MR. STEIN: Mr. Kinsey?

MR. KINSEY: I have no questions.

MR. STEIN: Mr. Poston?

MR. POSTON: No questions.

MR. STEIN: Mr. Gross, I note with interest at least three parts of your time schedule, the last three which have not occurred yet. One is "Arrange financing and submit construction plans by January 1, 1959." I assume this applies to all industries and municipalities on the Illinois side?

MR. GROSS: Yes.

MR. STEIN: The second is "Start construction by July 1, 1959", and the third is "Place in operation by December 31, 1961."

Would you say that those dates are acceptable for consideration by the conferees as a basis for establishing a time schedule?

MR. GROSS: They appear to be. It is quite possible in the building of any integral structure, that all component parts may not be finished at exactly the same time, but that obviously is no reason why those parts which can be completed should not be.

MR. STEIN: Thank you. I have no further questions.

Mr. Klassen, would you proceed?

MR. KLASSEN: I have no questions. You may proceed.

MR. GROSS: First we have with us today a very well-qualified man who is here as an observer representing the Ohio River Valley Water Sanitation Commission, Mr. Robert K. Horton, Assistant Executive Director.

Would you rise, please?

The progress made since the tabulating status summary can probably be best presented by the individual industries and municipalities. This could be in alphabetical order, or geographical order. We have chosen to make it alphabetical. Please state your name, your firm or corporation which you represent, give your written statement to Miss Poole, and try to confine your oral summary of your statement to five minutes as the Chairman has requested.

First, in alphabetical order, on industries. Alton Box Board Company.

I believe they have several people here

MR. MAUCKER: Mr Chairman my name is Robert B Maucker. I am the General Manager of the Paperboard Division of Alton Box Board Company.

Alton Box Board Company has long been interested in the abatement of pollution as is demonstrated by its membership and active participation in the activities of the National Council for Stream Improvement of the Pulp, Paper and Paperboard Industries

It is our understanding that we can contribute to this effort primarily by reducing the amount of fibre in our effluent which goes to the river. To effect this the company undertook such a program shortly after the original investigation by the Bi-State Agency and the publication of its report on Mississippi River pollution

Our first step was the installation of a screen tailing system on our largest paperboard machine to reclaim fibre, water and heat. This in itself reduced substantially the amount of fibre carried away in the effluent. Since then we have been engaged in the task of modifying the white water systems of all of the paperboard machines and the pulp mill in order to accomplish this same purpose. This work takes considerable planning, engineering and time to accomplish and is going forward.

Some two years ago we began to install a system at one of our other mills in another state. This work has not been completed as yet but promises to give us needed information in the nature of a pilot plan for our larger mill at Alton. Within the past few months we have also made some investigation of two different systems involving flotation by introducing air under pressure to float off fibre and other solid material and by mechanical-chemical aeration

We feel we have gone a long way in reducing the fibre in our effluent. This program will continue. It must be realized that these problems do not have at present definite and easy solutions

Thank you very much

MR. GROSS: Thank you Mr Maucker

There are a number of industries which are sewer-connected; as has previously been stated, quite a number who are here today may have no statement to make. Normally, if a waste is tributary to a public sewer system the waste then becomes an obligation of the public body or at least arrangements for pretreatment, if needed, should be made between the individual industry and the municipality. Among such sewer-connected industries is Armour and Company, who are tributary to the East Side levee and the sanitary district. Does Armour and Company wish to make any statement? If not, merely rise and be recognized.

Similarly, Circle Packing Company, same situation. Anyone here that cares to rise?

Darling and Company also of East St. Louis.

The Dow Chemical Company of Granite City, I believe, has a representative here.

VOICE FROM THE FLOOR: We do not have a statement to make.

MR. GROSS: East St. Louis Rendering Company?

The policy of not asking for trouble is a good one. Maybe that is why they are staying silent.

Well, there is a big problem in the East Side levee and sanitary district, but presumably it will be handled by negotiations between these industries and the public body.

Granite City Steel Company? I see Mr. A. C. Stoever, Superintendent of Utilities, is present.

MR. STOEVER: Mr. Chairman and members of the conference, Granite City Steel Company's industrial water supply since September, 1958 has been taken from the Chain of Rocks Canal at a point one-quarter mile above Lock 27 where a low service pumping station is located. A three-mile long low service main delivers water to the company's location in Granite City. Prior to last September, four Ranney water collectors, which are still available for emergency use, provided this supply. Lowering of the ground water table and inability to secure the increasing volumes of water necessitated by the growth of our company made the river water source a necessity.

Approximately thirty million gallons per day is currently being pumped out of the Chain of Rocks Canal. 90 percent of this volume is returned via the sewer system to the Chain of Rocks Canal one-quarter mile below Lock 27. This 90 percent of our total water usage consists of the water used through water-cooled furnace doors, door frames, dampers and water-cooled rolls on hot roll mills. Its only possible source of contamination is mill scale, iron-oxide, for the retention of which we have scale pits, overflow weirs, etc.

About 5 percent of our total water usage is lost through evaporation from spray ponds and cooling towers serving power plant condensers and a few minor closed-circuit water-cooled devices.

The remaining 5 percent of our total water usage is used on cold roll mills where oils of various nature are used in minute quantities to lubricate such rolling processes. The effluent from these mills is carried through an oil separation system and thence to the sewers which discharge water to the Chain of Rocks Canal one-quarter mile below Lock 27.

It should be noted that from our pickling operations, spent acids are carefully recovered and shipped via tank truck to a paint manufacturing plant where we find them salable at a small profit to us.

Thank you, Mr. Chairman.

MR. GROSS: Thank you, Mr. Stoever.

Also sewer-connected, East St. Louis, Hunter Packing Company. I believe Mr. Persson is here.

MR. PERSSON: No statement.

MR. GROSS: Thank you.

International Shoe Company, Wood River Tanneries; both Mr. Reck and Mr. Collins are present. They have an interesting treatment there.

MR. RECK: My name is Jack Reck. I'm with International Shoe Company, the tannery of shoes.

We have a tannery located at Wood River, Illinois, or in Hartford, known as the Wood River Tannery, and in January, 1936, the Sanitary Water Board of the State of Illinois called to the attention of industry above the East St. Louis area the objectionable pollution of the Mississippi River.

Mr. F. L. Collins, Assistant Director of Cherokee Laboratory of International Shoe Company in conjunction with K. K. Black, at that time connected with the Illinois State Water Board made studies of:

1. The waste liquors from our tannery.
2. Possible ways of decreasing volume of sewage.
3. Laboratory experiments.
4. Literature surveys on sewage disposal plants and equipment in use.

This was done to try and determine what would best suit our needs and be most economical to install and operate.

The analysis made in the laboratory showed the sewage leaving Wood River Tannery to contain 6800 parts per million solid matter. The water used during the year being about 300 million gallons; the solid matter in the sewage was calculated at 17 million pounds per year. The discrepancy of 4 million pounds is largely water in the tanning supplies, used, which were not calculated back to a dry basis.

From the laboratory experiments and the literature survey made by Mr. Collins, the conclusion was reached that primary sedimentation of the mixed tannery effluent was the first step in sewage purification. It was found that this treatment gave the highest degree of purification for the investment involved in practically any sewage treatment, and tannery effluent was no exception.

The problem of any sewage purification is to produce an effluent which will meet the demands of the stream into which it is discharged. With this in mind, and after a successful pilot plant operation, recommendations were made that primary sedimentation of the tannery effluent be made.

As the result of these recommendations International Shoe Company purchased 40 acres of ground about one-half mile west of the tannery on what is now the river side of the present levee. On this property and at that time, we constructed one settling basin 210 feet wide by 1500 feet long. The tannery effluent entered the basin at the east end and flowed through the 1500-foot length and out the west end over a concrete spillway with provisions for a measuring weir to the river giving us a retention time of 7 days. This retention reduced the solids 90 percent and the B.O.D. 50 percent in our effluent to the river.

Approximately three years later test showed a build of solids in our retention basin and a second basin was constructed 210 feet wide by 1200 feet long to be used while the first basin was being cleaned.

After cleaning the original basin, it was put back in use and the tannery effluent was diverted to again flow through it, allowing No. 2 basin to dry.

In 1946, a third basin was constructed and tannery effluent was diverted to flow through No. 2 and No. 3 basin, thus increasing the retention time and allowing No. 1 basin to dry. This is the way we are operating at the present time.

No. 1 basin is drying; No. 2 and 3 are in operation.

Because of a decrease of over 60 percent in production the effluent from the tannery and load on the river has been proportionally reduced. Build-up of solids in the basins have also been reduced, increasing the time periods between cleaning, and it is on this basis that we are working at the present time, and we have this that I have outlined to you in operation.

MR. STEIN: Thank you.

At this point I think we may adjourn for lunch. I think we are developing the picture rather well here.

This afternoon, after a bit more development, we will attempt to set up a time schedule for remedial action indicated, and also a summary of that action.

We will reconvene promptly at one o'clock. I think we are going to have to adhere to that time rather strictly if we intend to get through. With that we are adjourning until one o'clock.

(NOON RECESS)

MR. STEIN: May we reconvene?

We will call on Mr. Klassen and Mr. Gross again to call on their folks for statements, and we would like to remind you that we asked you to adhere to the five-minute limitation and submit the statement to Miss Poole if it is any longer for inserting in the record.

Now, if any of the folks aren't here, and they probably will be coming in, Mr. Gross will go through the list again and pick those folks up.

Mr. Gross?

MR. GROSS: Mr. Chairman, ladies and gentlemen, Monsanto Chemical is the tail that wags the dog in Monsanto. They have done a lot of good work, and Mr. Paul Hodges, I believe, is present -- was. He will probably return.

Olin Mathieson Corporation. Mr. John Carruthers is here?

MR. CARRUTHERS: Yes, sir.

My name is John Carruthers, and I am an employee of Olin Mathieson Chemical Corporation.

The East Alton plant of Olin Mathieson Chemical Corporation is located on Wood River, approximately two miles above its mouth at the Mississippi River. The plant site area, comprising several hundred acres, lies astride the Wood River for a distance of almost three miles. Most of the activity of the plant is confined to a rather small area of about sixty acres known as Zone 1.

The Wood River, the receiving water course of all waste from the plant is little more than a drainage ditch during a large portion of the year. Although it drains an area of 125 square miles, the character of the water shed is such that there is no sustained flow. Consequently, for 80 to 90 percent of the year, the flow in the river is the discharge water from Olin Mathieson Chemical Corporation, Laclede Steel, Alton Boxboard and domestic sewage from the Village of East Alton.

The water shed is largely upland areas with relatively steep slopes and no marshes. This type of terrain is conducive to flash floods which occur at more or less frequent intervals. Backwaters from the Mississippi reach up to the plant site each year during the high water periods of that river. From the Olin Mathieson plant downstream to the mouth, the Wood River is almost entirely enclosed with a system of earth dikes. The stream is thus, for the most part, completely hidden from view from outside the dikes except for bridge crossings, of which there are several, for highways and railroads. The area between the dikes is closed as a public thoroughfare. These areas are not now used for habitation, industry or recreation and no such uses are contemplated. No use is made of the water in the Wood River. The untreated sewage from the Village of East Alton discharges into the river below the Olin Mathieson plant.

No complaints from any source have been made concerning the pollution of the Wood River to our knowledge. The Illinois State Board of Health has never notified us that conditions are a nuisance.

The average daily demand for water for the whole plant amounts to approximately 5.0 million gallons. No immediate feasible means for determining a division of amounts between uses is available. However, most of the water taken into the plant as a whole must eventually be disposed of in the stream.

Odors are non-existent. Laboratory tests have been periodically made on water samples taken at various points downstream from the Olin Mathieson plant. These were grab samples indicating the conditions only at one particular time. They indicated a sterile or bacteria-free water. This is brought about, no doubt by the presence of acids and metallic salts which act as sterilizing agents. The alkaline sludge wastes from the water downstream from the plant tend to neutralize the acids. The diluted wastes could hardly be regarded as a potential menace to health. In general, however, considering the inaccessibility of the stream from human activities as well as the weak solution of chemicals generally existing in the stream, there seems to be little possibility of the stream being any menace to the health of the community.

Since there is no naturally sustained flow of water within the Wood River bed and since the bed has been straightened, leveled and depressions for pools eliminated when the earth dikes were constructed, there is no possibility of acuatic life existing within the stream. We also believe that the very small amounts of acid and copper compounds released to Wood River are either neutralized downstream by alkaline wastes or are completely diluted upon entry into the very large Mississippi River. Based on this, we do not believe that our wastes are in any way destructive to the food of the aquatic life in the Mississippi River.

Our company has been alert to the problem of possible pollution and retained a reputable firm of consulting engineers of Chicago, who are members of the American Water Works Association and the American Public Health Association to study our waste conditions. Their conclusions confirm our opinions.

Thank you.

MR. STEIN: Are there any questions?

MR. KLASSEN: Not particularly at this time. I don't say that we agree with all of the conclusions that have been voiced, but those are matters that we can individually take up with the corporation rather than to air them here.

MR. STEIN: Thank you.

MR. GROSS: Owens-Illinois Glass Company of Alton.

(No response.)

Probably not back from lunch.

St. Louis National Stockyards were invited to observe, and they are sewer-connected, I believe. Anyone here who wishes to be recognized, St. Louis National Stockyards.

(No response.)

Shell Oil Company? Mr. Lee Burroughs is here from New York, and Mr. Sample from the Wood River Refinery.

Mr. Sample?

(No response.)

Sinclair Refining Company.

MR. KOPISCH: I am L. C. Kopisch, Technical Director of Sinclair.

Sinclair Refining Company instituted an active and continuing program of pollution control in 1950. At the time of issuance of the report of the Bi-State Agency in 1955 with its recommendations for water quality objectives, Sinclair's program was then well along towards completion. Effluent water now released from Sinclair's plant meets the standards defined by the Bi-State Agency. The facilities described in Sinclair's report of July 13, 1956 to the Bi-State Agency have been constructed and are in operation. The completed facilities include the following:

1. Construction of a "Guard Basin" and new storm sewer to handle runoff water from the entire refinery. This guard basin has a capacity of approximately 2 million gallons and any oil accumulation is separated and pumped back to the refinery. Water is removed as necessary by pumping to the natural drainage ditch which ultimately leads to the river. By this procedure any ground oil which finds its way into the sewer is collected and pumped back to the refinery.

2. The oil and water separators have been materially enlarged. This has resulted in reducing the oil content of the effluent to something less than one-half of its previous concentration.

3. Additional cooling towers have been built and placed in service. These have resulted in greater reuse of plant water and a decrease in the effluent volume leaving the plant.

4. Two separation settling pits have been placed in operation into which the refinery effluent is alternately directed. These pits have a total retention capacity of 35 million gallons. Calculations indicate that the required phenol concentration of 2 parts per billion after initial dilution will be met with an effluent concentration of 10 parts per million. Tests on the effluent from the settling pits indicate that the average phenol concentration is considerably below this required level.

Since the completion of these facilities, which represent the extent of those planned to meet the Bi-State Development Agency requirements, continued study and work on the pollution problems is being carried on.

Careful studies have been made of the operation of all the facilities to assure that they are adjusted for maximum efficiency. In addition to the facilities heretofore described, Sinclair has installed at the refinery spent caustic neutralization and foul water stripping facilities. Spent caustic is neutralized and stripped by flue gas containing carbon dioxide. Foul water is stripped by flue gas and steam. These processes reduce the concentration of phenol going to the settling pits.

Sinclair Refining Company is maintaining a continuing study of the pollution problem to determine if further improvements can be made.

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MR. GROSS: Monsanto Chemical?

Mr. Paul Hodges.

MR. HODGES: I apoligize to the group for being late, but the little waitress just didn't get to us.

This report presents the accomplishments and plans of the W. G. Krummrich Plant of Monsanto Chemical Company in preventing pollution of the Mississippi River.

Our large chemical plant produces about 65 products simultaneously. Most of these individual products require handling and processing of several raw materials or intermediate process goods, thereby creating quite complex problems in waste disposal. Our wastes, diluted with fairly large volumes of spent cooling water, are discharged to the sewers of the industrial municipality, Monsanto Village of which we are a part. The village wastes are collected at a pumping station which discharges into the Mississippi River.

We have always recognized the need in our plant to treat known toxic wastes such as cyanides to make them harmless before sewering and to minimize sewering of wastes which might be objectionable. Beginning in early 1956, we intensified our efforts in this direction and set up a formal program. Heading up this program is an experienced chemical engineer who, after having received training in industrial wastes technology, has been devoting full time directing and co-ordinating our waste reduction efforts. An additional man is now also assigned to this work.

Our pollution control work is taking two courses. First to include in the design of any new installation adequate facilities to dispose of wastes in a manner which will not create new pollution problems. This is a recognized policy at Monsanto and we adhere to it rigidly. For example, during the past summer we evaluated an important new additional product for our plant. The high cost of adequate waste treatment was a major factor in our decision not to proceed with the new installation. With the most recent addition to our family of products, very small amounts of mercaptans are formed as a waste by-product. These mercaptans are offensive because of odor. One thousand five hundred dollars was spent for equipment to treat these wastes and continuing operating cost of the treatment is about $200 per month.

The second, and a very difficult and expensive course that we have undertaken, is to correct problems caused by existing operations. Our first step was to get the facts -- to find out the size, character and composition of the waste streams. In our case, this was difficult because our quite old sewers had not been designed for ease of sampling and measuring flows. Suitable commercial sampling equipment could not be purchased, so we had to devise continuous samplers.

We have also devised a new sewer flow measuring technique and will be happy to share either of these developments with companies having similar problems.

With the information obtained, our plant has been actively developing projects to alter equipment and processes to reduce our wastes to a practical minimum. Since we first started the formal program two years ago, 28 major projects, costing over $250,000, have been completed. This expenditure has resulted in very substantial decrease in our sewered wastes. In design and construction stages, but definitely scheduled for completion in 1958, are 11 more projects which will cost an additional $150,000.

As to the future, we plan to actively continue this work of studying our operations and developing projects to reduce to an absolute minimum any wastes which may be objectionable. Naturally, we have been concentrating our efforts on the discharges containing the largest amounts of wastes. These offer the best prospects for both pollution reduction and possible financial return. Projects now underway and future projects will become progressively more difficult and expensive and will offer continually decreasing return.

Be assured of our continued co-operation in helping to prevent pollution of the Mississippi River. We must realize, however, that a vast expenditure of effort and money and a lot of time will be necessary to do the job.

MR. GROSS: Thank you.

Standard Oil Company of Indiana, Wood River Refinery

Mr. Roedel is here.

MR. ROEDEL: Gentlemen, I am J. K. Roedel, Chief Engineer of the Standard Oil Company Refinery at Wood River. I would like to tell you what our company is doing to eliminate pollution of the Mississippi River by our refinery.

As Mr. Brown mentioned this morning, the most recent step by Standard Oil Company in our water effluent improvement program at our Wood River Refinery has been completed. It was the installation of a series of basins or oxidation ponds through which our refinery waste waters, including sanitary wastes, are diverted before they are released to the Mississippi River. This most recent improvement was made at a cost to our company of more than $250,000. Additional costly improvements are scheduled.

The ponds cover an area of about 39 acres and hold about 100 million gallons of water. The various sections are separated by earthen dikes containing underflow culverts. Principals involved in purification of wastes by these oxidation ponds are sedimentation and biological oxidation. The holding time in the ponds at the present rate of discharge to the river is about four days. The first pond is a small pond about 1.5 acres and is primarily an oil collection basin. A copy of Drawing E2477-1 showing the waste disposal system is attached.

Plans for this installation were presented to the Illinois State Sanitary Water Board in August, 1956. A permit to proceed with construction was received from the Sanitary Water Board in September, 1956. The waste disposal system was put into operation in December, 1957. Permanent facilities for recovering oil from the oil collection basin remain to be installed. Design work on these facilities is underway and construction will begin this spring.

Although the system has been in operation only about two months, the results to date indicate a substantial improvement in the quality of the water effluent from our refinery. We have also received letters from users of water downstream of our outfall commending us for the improvement which has occurred since our new oxidation ponds were put in operation.

In addition to the new oxidation ponds, we have underway a refinery modernization and expansion program which will be completed during 1959. Expansion of our cooling pond facilities is included in that program, and it will reduce the volume of refinery effluent.

We believe that we are doing a good job of reducing the amount of waste material leaving our Wood River refinery in the water effluent. Nevertheless, we will continue our efforts to abate pollution of the Mississippi River.

(Which said copy of Drawing E2477-1 is an attachment to the original copy of this transcript)

MR. GROSS: Thank you, Mr. Roedel.

Socony Mobil East St. Louis Refinery.

Mr. Hermanson.

MR. HERMANSON: My name is Don Hermanson, and I am assistant to the refinery manager at Socony's East St. Louis Refinery.

I would like to say at the beginning that the management of Socony Mobil's East St. Louis Refinery is happy to participate in this conference. The Manufacturing Department of our company has an announced policy concerning air and water pollution under which the local refinery management is directly charged with the responsibility of eliminating air and water pollution from our plant as sources of annoyance or discomfort to the surrounding community. This policy recognizes our responsibility as a corporate citizen of the community in which we operate.

We realize that success in these aims depends upon cooperation with our industrial and municipal neighbors and with the various government and health agencies represented here today.

Since 1950 our refinery has spent about $200,000 for facilities to prevent pollution in our effluent water which is discharged into the Mississippi River through the Monsanto Village sewer system These include facilities for multiple settling and skimming of the accumulated waste water from all of our operations.

Our present engineering studies for control and improvement of our effluent are directed toward improving the quality of water coming from individual operations to insure that the final treating facilities will not be overloaded. Our present construction plans include improvements to our coking operation which will reduce the quantity of solid coke fines reaching the final separators We expect this to help not only in controlling the solids content of our effluent but also in reducing oil which is absorbed on solid particles

The 1954 report of the Bi-State Development Agency identified phenolic compounds as one material of particular concern in the Mississippi River. For this reason we have studied our operations and have identified the sources of the small quantities of phenolic material in our waste water. With this knowledge we believe we can control phenols in our effluent to an acceptable level We would welcome any further guidance as to quantities of phenolic materials that would be considered undesirable.

Thank you.

MR. GROSS: Thank you

Warden Ross Randolph possibly wishes to return to Menard If he's here, would you care to present the sewage treatment angle now of the Menard Prison?

MR RANDOLPH: I would like Mr Marquardt to my chief engineer.

MR. GROSS: Yes sir

MR. MARQUARDT: As you gentlemen remember, about 1948 it seemed like the Federal Government was going to step in and clean up the Mississippi River, so at that time the engineers at Springfield made drawings of a disposal plant to handle our sewage

We located the ground, done some excavating, tests, and got ready for business. Then, later, we found out that the government wasn't going to take any part in it, so with the additional expenses that it would cost to build this plant, it was, well, dropped by the wayside, I'll say, and then forgotten, but any time that the upstream from the different industries and cities clarify their waters, we'll certainly clarify ours. Thank you.

MR. GROSS: Thank you.

Swift and Company, East St. Louis? I don't think they need present a statement.

Do you wish to rise?

VOICE FROM THE FLOOR: No statement.

MR. GROSS: Thank you.

Union Starch and Refining Company, Granite City. Mr. J. S. Hunter, General Manager.

Is Mr. Hunter here?

(No response.)

Has Owens'Illinois Glass Company's representative come in?

MR. FEDORCHAK: Yes.

Mr. Chairman and delegates, I am William Fedorchak, Plant Engineer of Owens-Illinois.

We are greatly interested and concerned with the program of abating the pollution in the Mississippi River.

Our main interest lies in the fact that most of the water consumed by our company is obtained from a series of four deep wells, lying adjacent to the river, and bearing water from a depth of 80 to 90 feet. We are of the opinion that these wells are located in cones of depression where water levels are lower than the normal stages of the river. This condition probably causes considerable recharge from the river to take place. Therefore, any contaminated condition of the river water would have a direct effect on our plant filtration system.

A study of Owens-Illinois waste discharge tends to indicate that we are not faced with a serious pollution problem even though the total average discharge is three million gallons daily. Most of the discharge constitutes unpolluted, clear water that is principally used as a cooling agent in our operation, and only a small part of the total discharge is representative of sanitary sewage.

Thank you.

MR. GROSS: Thank you.

There are quite a number of sewer-connected smaller industries in Alton.

Mr. Thomas J. Butler is General Manager of the Alton District Manufacturers' Association. Is Mr Butler here?

MR. BUTLER: Yes, sir

Mr. Chairman and members of the conference my name is Thomas Butler. I am General Manager of the Alton District Manufacturers' Association, which includes 18 of the largest industries in the Alton-Wood River area.

Individual reports of the efforts that are being made to abate stream pollution are being presented here by the plants themselves I can say to you that conferences have been carried on over the past ten or twelve years with the Sanitary Water Board of Illinois and they have been very patient and reasonable in their approach to the problem realizing that in each industry the problem of abatement of pollution is a different one.

The effluent from these widely divergent industries is not uniform in any respect. There are three petroleum refineries a steel mill. explosives, and brass plant paperboard mill and so no common denominator exists for them. Each one is making its studies as it finds they may be applied to its own effort.

I understand that the Shell Corporation was called a minute ago and hadn't returned yet from lunch but I believe their representatives are here now and are able to tell you of the filtration plant that they have recently put into operation and I can also say that the Sinclair Oil Refinery has an operation for reducing the stream pollution

The small plants have less a problem and I think probably will be covered by any community report that may be made

Our engineers from time to time have been subject to call by the Sanitary Water Board, as their representative who appeared here before you told you, to abate the problem.

MR. GROSS: Thank you, Mr Butler.

We regret to learn of the passing of Mr James A Stirns Manager of Associated Industries, East St. Louis.

Is there anyone here representing the East Side Associated Industries.

(No response.)

East Side Manufacturers' Association, Granite City, Mr. G. W. Hoelscher?

Do you have a statement to make?

MR. HOELSCHER: I will just speak from here, if you don't mind.

I'm here just as an observer, and our industries that Mr. Klassen spoke of in our district will make our report.

MR. GROSS: Thank you.

Shell Oil Company, Wood River Refinery?

I know Mr. Lee Burroughs of New York City and Mr. Sample of Wood River are both here.

Mr. Sample, are you going to submit a statement?

Our industries will make our own report on their operations.

MR. SAMPLE: I am G. E. Sample, Manager of the Effluent Control Department, Shell Oil.

A large oil refinery, owned and operated by the Shell Oil Company, is located near Wood River, Illinois, and about two miles east of the Mississippi River. Waste water from this plant enters the river at about mile 197. There are two other oil refineries in the same general area. Downstream, some 5 miles and also on the left bank of the river, is the raw water intake of the East St. Louis and Interurban Water Company. Almost directly across the river from this intake, the Missouri River joins the Mississippi on the right bank. The flow from the Missouri acts to divert the downcoming Mississippi current toward the left bank and hence prevents a rightward diffusion of any flows entering on the left bank. This circumstance of river flow dynamics and geometry tends to hold to the left bank anything that enters the river on that side. This has for years created a special situation which prevented dilution of entering wastes and intensified pollution problems on the east or left side of the river.

We at Shell have been aware of this situation for many years dating back to the early thirties when our first laboratory research was started on pollution problems. Prior to that time, the crude oil supply was "sweet", that is, it was low in sulfur and the products therefrom required little chemical treatment and hence, relatively little pollution was in evidence. However, this condition began to change when the crude oil supply gradually increased in sulfur content and more and more drastic treatments were required. Also, the introduction of new refining processes brought new problems. Phenols began to be used in extraction processes; some phenolic compounds began to appear even in the oil products as a result of "cracking" processes, to cite only a few.

Until recently our philosophy of pollution control had been to eliminate the pollutant at its source or the operating process where it originated. This involved the construction of elaborate collection and detention systems. Also special treatment of collected concentrated pollutants such as spent caustics, phenolic waters, etc., was started as exemplified by chemical neutralization plants and sour water strippers. Several million dollars were spent in construction and operation of these facilities over the years. But despite this considerable effort, there was insufficient improvement in the quality of effluent waters. These "source facilities" had done and still are doing a good job. But as refinery processes proliferated in number and complexity, it became apparent that this approach was no longer practical due to the increasing multiplicity of sources of relatively unconcentrated contaminants.

The next step obviously was to apply some treatment to the bulk effluent as it leaves the refinery. With this change in philosophy, laboratory research and pilot plant work was started in 1952 to establish a practical approach to this problem. By late 1955 a three-step treating procedure had been perfected and approximately $1,000,000 allocated for construction of the necessary facilities.

By July, 1956, the engineering drawings had been completed and a permit for construction had been received from the Illinois State Sanitary Water Board.

Construction of the new facilities was started in December 1956. The facilities were completed and put into operation in December, 1957.

In brief, the facilities provide three steps of treatment as follows:

First Step: pH control before the final refinery oil-water separator by automatic addition of acid or caustic for maintenance of a pH of about 8.0. This is essential for effective oil removal in the separator and for the treating steps which follow.

Second Step: Aeration of the effluent water for reduction of oil content by flotation, and of sulfides, mercaptans, and easily oxidizable organics by air oxidation.

This step includes a separator box equipped with flight scrapers and desludging facilities and a 12-hour retention basin for removal of air-floated oils and settleable solids. The retention basin also evens out variations in composition of the water.

Third Step: Bio chemical oxidation, on a trickle filter, 140 feet in diameter and 10 feet deep, of the aerated water from the detention basin.

Aside from minor difficulties at the start, the plant has operated satisfactorily. Two changes to improve the hydraulics of the plant are being made. Bacteria started growing on the trickle filter shortly after the start-up and "seeding" was not required. The filter has not yet attained its maximum anticipated activity but the threshold odor of our effluent has been reduced about 95 percent and C.O.D. about 70 percent. The East St. Louis and Interurban Water Company report to us that there has been a very noticeable improvement in the quality of the water at their intake.

MR. GROSS: Thank you.

Has Mr. Hunter of Union Starch and Refinery come in?

(No response.)

St. Louis National Stockyards?

(No response.)

The City of Alton?

MR. DAY: I am P. W. Day, Mayor of Alton.

Mr. Chairman, I have the following statement:

The City of Alton, Illinois acknowledges that it has received from the Illinois Sanitary Water Board the schedule of work requested to eliminate the discharge of untreated sewage into the Mississippi River by December 31, 1961.

The City of Alton, Illinois is familiar with the authority of the Sanitary Water Board and of the United States Public Health Service pursuant to Public Law 660.

The city desires to cooperate with the appropriate state and federal agencies and with the communities in both Illinois and Missouri which are involved in river pollution abatement. As evidence of the intention to cooperate, the city has complied with items one and two of the schedule issued by the Sanitary Water Board. On July 25, 1956, the city employed the firms of Sheppard, Morgan and Schwaab and Crawford, Murphy and Tilly to appraise the city's existing sewerage system and to prepare recommendations and cost estimates for the construction required to intercept existing sewer discharges into the Mississippi River and to provide primary treatment. This study was made and the engineers submitted their report on September 19, 1957.

Briefly, the engineering report presents two alternative courses of action for the consideration of the city. The first alternative would extend the benefits of a public sewer system to the entire area falling within the Alton drainage area without regard to existing city limit lines. The second alternative would provide sewerage service and treatment only to the area within existing city limits. The estimated cost for the first proposal is $6,851,000 and for the second proposal, $5,708,000.

These alternative plans are mentioned because they complicate proceeding further in accordance with the Sanitary Water Board's schedule. It is obvious that the plan to provide sewerage service to the drainage area is much to be preferred over the limited second alternative. The rapid growth and continued development of the areas adjacent to but outside of the City of Alton dictates the need for a system of sanitary sewers to serve those areas; in most of the territory included within the drainage area, this is a present and not a future need.

The City of Alton is of the opinion that every reasonable attempt must be made to secure the willing cooperation of the residents and industries in the area outside the city limits who would be afforded sewerage service under alternative one. This requires considerable time for discussion, consultation, negotiation and education, for in many cases these individuals and industries are without the benefit of the incentive for quick action which the Sanitary Water Board schedule provides the city. Nevertheless, we believe our obligation to these areas is quite clear even though the time required may to some extent delay strict compliance with the Sanitary Water Board schedule.

It also may be pointed out that a substantial differential in levels of property assessment within the city and in the unincorporated areas outside the city seem to make doubly difficult the task of persuading Alton taxpayers that they would not be carrying an unjust proportion of the tax load under any plan of financing based, even in part, upon property taxes.

As a municipal corporation, we face a second major hurdle in proceeding with the implementation of the engineering recommendation. Here we speak of the matter of financing. Obviously, to finance a project of the magnitude of that which we face will require the issuance of municipal bonds. Such bonds can be retired only from revenues received from our citizens either in the form of taxes or service charges. Under the laws of the State of Illinois, such bonds must be authorized by vote of a majority of the electors. To adequately inform the voters of the need for the present improvements and to convince a majority of them that the solution to the problem is worth the cost to them as taxpayers or sewer users is an imposing task indeed. We are confident that when the facts have been fully, carefully, and patiently explained, the voters will respond with approval of the necessary financing. This step, however, will also require time, for to present a sewer bond proposal to uninformed, insufficiently informed, or erroneously informed electors would be to seriously jeopardize the outcome of the election and could only be considered folly.

Unlike the vast majority of Illinois communities, the City of Alton does not own or operate a municipal water works. Study and experience in hundreds of communities has indicated that private ownership of a water system is quite incompatible with the financing of major sewer system improvement projects. Sewerage revenue bonds demand much higher interest rates than do combined water and sewerage revenue bonds. Without means of controlling the use and consumption of water, the city lacks an effective means of enforcing sewerage service charges. Duplication of administrative, operating, maintenance, and billing and collecting functions in cities having both private water and public sewer systems is inefficient, wasteful, and without justification.

For a number of months a select committee of citizens of the City of Alton has been studying the possibility, the ramifications, and the problems incident to municipal acquisition of the Alton Water Company properties. This committee is nearing the completion of its study and already has submitted to the City Council a preliminary report of findings and recommendations. Based upon that report it would appear that acquisition of the water company by the City of Alton would require a minimum of from 12 to 18 months. This step, too, would be dependent upon approval by the electors of the necessary means of financing the purchase of the now privately-owned water company properties.

We believe these few statements will indicate that the City of Alton is proceeding as rapidly as possible with the steps necessary to eventually comply with the order to cease the discharge of untreated sewage into the Mississippi River. The City of Alton, however, contends that the schedule promulgated by the Sanitary Water Board is unrealistic in its application to the unique conditions which prevail in Alton. The city is willing to recognize the schedule as a desirable goal, but it must insist that due recognition be given by the Sanitary Water Board to the fact that strict compliance with the schedule may not in all cases be possible for reasons such as those hereinbefore outlined.

The City of Alton intends to proceed with its plan for sewage treatment as rapidly as possible giving due consideration to the need for carefully preparing each step in the processes leading to eventual completion By this we mean that the city will continue with such measures as may seem appropriate to implement the first alternative as presented by the consulting engineers while at the same time taking care to avoid unwise and unnecessary financial burdens on the citizens of Alton and those who will benefit from the new sewerage system

I have a copy of Morgan and Schwaab's report that I would like to present if you would like to have that

MR STEIN: Yes

(Which said report "City of Alton Illinois - A Report on Sewer Improvements" August 31 1957 by Sheppard, Morgan & Schwaab and Crawford Murphy and Tilly Consulting Engineers is an attachment to the original copy of this transcript)

MR GROSS. Thank you Mayor Day

City of Chester?

MR WINGERTER: I am Clayton Wingerter Superintendent of Water and Sewers at Chester, Illinois

We received a letter the same as all the rest of them did, and last night the City Council and the Mayor signed an agreement with John Blankenship and Associates of Crawford Murphy and Tilly, consulting engineers to make a survey and report what was necessary for Chester

That is about all.

MR GROSS: City of Columbia Albert C Metter?

MR METTER: Mr. Chairman, Mr Klassen, members of the conference, my name is Albert C. Metter Mayor of Columbia Illinois.

Columbia as you know is located in Monroe County, Illinois. It is a small community, but our outfall is now in a contaminated section in St. Louis and East St. Louis. We are willing to cooperate and go along, of course, since we are in a contaminated section, but ours is a drop in the bucket, but we will do our part, and with that I have a statement here, short statement to present, and a copy of the engineers' report.

The City of Columbia, Illinois being cognizant of the cooperative schedule established by the Advisory Committee for the municipal progress toward abatement of pollution of the Mississippi River acknowledges receipt of your letter of February 3, 1958 as well as previous communications and discussions concerning this matter.

The Mayor and Council of the City of Columbia concur with the program of abatement of pollution of the river on a cooperative basis and believe that a program, all-embracing in nature, is not only commendable but a definite necessity. Based upon this attitude, the city by formal action of its board authorized its consulting engineers, Russel & Axon, to commence engineering studies in October, 1956. These studies were to include sewage treatment facilities.

In accordance with the authorization our engineers immediately inaugurated studies covering the needs of the City so far as treatment facilities were concerned. These studies were completed and presented to the city in May of 1957. Copies of the studies which are included in a formal engineering report were accepted and placed on file by the city in August of 1957. Copies of these reports have been filed with the State Sanitary Water Board.

As a part of the engineering report the city authorized its engineers to formulate studies of outfall and trunk sewers and to coordinate such studies with the studies of sewage treatment facilities. This action was taken by the city so that all future sewer construction would be coordinated with the program of eventual sewage treatment. As of this date two of the major trunk sewers are under construction and the third and last trunk sewer, preliminary planning of which has been completed, is under active consideration for immediate construction.

The city is ready to undertake the third phase of its abatement of pollution program, that of arranging financing and completing construction plans immediately upon assurance that all other cities and industries contributing to the pollution of the river are doing the same.

The construction of sewage treatment facilities will impose a heavy financial burden upon the city, as the engineers' estimate of cost is approximately $130,000. The City of Columbia has in the past and will continue to cooperate with State Board of Health and stands ready to continue this cooperation upon definite assurance that all contributors of pollution to the river are actively engaged in the elimination of pollution. Respectfully submitted.

I have this here in triplicate also a copy of the report for your file.

(Which said report "Engineering Report - Sewerage System Improvements - Columbia Illinois, May 1957" is an attachment to the original copy of this transcript.)

MR. GROSS: Thank you.

Village of Dupo.

MR. SMOTHERS: Mr. Chairman, my name is N. B. Smothers, President, Village of Dupo.

The present board and village president has been in office for a period of six or seven months. The importance of this problem was not conveyed recently enough for our board to take such action required in past communications.

We are programming extensions of sewage with full thought given to sewage treatment in future construction.

The Village of Dupo is in complete sympathy with the contents of Public Law No. 660. We are open for suggestion, aid from agency, and very willing to cooperate in the over-all program.

Thank you.

MR. GROSS: Village of East Alton.

C. H. SHEPPARD: I am C. H. Sheppard, engineer for the Village of East Alton, and I have a statement from the president of the board, Mr. Van Preter, who was unable to be here today. There is a gas rate hearing, I believe, in Springfield. He had to be up there.

"The Village Board has held several meetings relative to complying with the directive from the Illinois Sanitary Water Board dated July 27, 1956. At a special meeting of the Village Board held on February 28, 1958 Mr. C. H. Sheppard, Village Engineer, was instructed to obtain data on alternate methods of sewage treatment and prepare preliminary plans and estimates of cost. At this meeting the securing a treatment plant site was also discussed.

"It is believed that financial assistance will be required in providing the necessary sewage treatment plant. The Village Board intends to have plans for a sewage treatment plant in readiness for a possible federal public works program.

"I have reviewed your request for a schedule of intended progress toward acceptable disposal of pollutional wastes. Any schedule that the Village Board sets up will necessarily be predicated on our ability to finance the improvement.

"It is hoped that a satisfactory treatment plant site can be secured by September 1, 1958. Plans and specifications will be completed by January 1, 1959 or sooner if the occasion demands. Actual award of construction contracts will remain indefinite until financing can be worked out. As heretofore stated, if a federal public works program is instituted, every effort will be made to have all details including a treatment plant site in readiness for immediate consideration.

"Respectfully submitted,

"C. A. VAN PRETER

"President of the Board"

MR. GROSS: Thank you, Mr. Sheppard.

I believe the Village President of Roxana is riding with Mr. Sheppard, and although I agreed to read his statement, he is still here, and I think he should have the honor of presenting it.

Mr. Nail.

MAYOR NAIL: Mayor Nail from Roxana.

I might just state that our village engineer has the preliminary plans made for the treatment of sewage from a small village the size of Roxana, but, friends, if you know of anybody that would have a plot approximately two acres in area that would be available in our immediate area, we would certainly appreciate it.

Thank you.

(Mayor Nail's written report is as follows:)

"I wish to report for the Village of Roxana, Illinois on progress toward compliance with the directive from the Illinois Sanitary Water Board dated July 27, 1956 as follows:

"1. As President of the Village Board I contacted Mr. Horace Dale, Manager of the Roxana Plant of Shell Oil Company relative to including the treatment of sewage from the Village of Roxana in the new treatment plant for their industrial waste. It was found that this would be impractical.

"2. The village engineer, C. H. Sheppard, was instructed to obtain preliminary data on type of treatment to be required.

"3. The required area for a treatment plant site was determined and a desirable location selected in property of Shell Oil Company.

"4. A meeting with Mr. Horace Dale, Plant Manager of Shell developed the fact that the site selected would seriously interfere with proposed plant development.

"5. A meeting was then arranged at St. Louis with the International Shoe Company officials in an effort to obtain a treatment plant site within their property. We found that the site selected was already under option for sale. The party holding the option was unwilling to sell.

"6. About six weeks ago a meeting was held with Mr. Butterworth, Manager of the Wood River Plant of Standard Oil Company relative to securing a treatment plant site within their property. No final answer has been obtained.

"7. Alternate types of primary treatment are at present being studied by the village engineer and preliminary plans will be prepared as soon as a treatment plant site has been secured.

"It is hoped that a suitable sewage treatment plant site can be secured by May 1, 1958, plans completed by January 1, 1959, financing arranged and construction contract awarded by January 1, 1960, and plant placed in operation by January 1, 1961.

"Respectfully submitted

"KENNETH E. NAIL

"President of the Village Board"

MR. GROSS: Thank you.

East Side Levee and Sanitary District

MR KERNAN: My name is Kernan, engineer for the District.

Mr Lischer of the firm of Horner and Shifrin, who is also a partner has been consulting engineer for the District for 25 years. I would like to have him make the report.

MR LISCHER: There has been prepared a statement which has been submitted and I will read from a short summary of that statement.

The area embraced within the boundaries of the East Side Levee and Sanitary District comprises nearly all of the American Bottoms between the Cahokia Floodway on the north and Prairie du Pont Creek on the south.

The area includes East St. Louis Monsanto, Granite City, Venice, Madison, Washington Park, Fairmount City, Cahokia, Brooklyn, and National City, all which have sewage collection systems. Some of these systems are tributary to the trunk sewers of the district, primarily to the Landsdowne sewer, the Cahokia outlet sewer and the East St Louis sewer

The cities of East St Louis, Granite City Madison Venice and the Village of Monsanto maintain and operate separate outlet sewers serving their respective areas. With respect to abatement of pollution related to the discharge from these five sewers, the initial responsibility might seem to rest with the five communities. However the District has authority to undertake such abatement.

The Board of Trustees of The District is sympathetic to the objective of the pollution abatement program, and is prepared to undertake the work incident thereto. A preliminary analysis of the situation indicates that an over-all coordinated plan would probably be the most efficient and least expensive, both as to capital cost and annual operation expense

The Board of Trustees of the District proposes to undertake the necessary studies, to develop alternate plants, to determine costs of installation and annual operating expense. From these the best and most economical project will be developed. It is estimated that the study will require a period of 18 months and involve a cost to the District of $120,000.

The statement which we have filed here in behalf of the Board was written on February 19th, and it states that within the next 30 days the District would file an application for a Housing and Home Finance advance loan within 30 days. On last Thursday that application was submitted and the District is hopeful that the application will meet with approval and that funds will be available so that the study can be initiated by July 1958

I might add that in the Kansas City area the studies there are going forward with this type of loan and it is a loan which is to be repaid at the time that construction starts

The Board has tentatively selected the consulting engineering firm of Horner and Shifrin to carry out the study; it expects shortly to enter into a contract with that firm subject to the availability of loan funds.

Upon completion of the study the determination of the best plan, and of the cost thereof, the Board of Trustees will confer with municipalities within the District as to the execution of the plan, and the financing of it. It may be that the economics of the plan would be such that one or more municipalities now discharging sewage directly to the Mississippi River will desire to finance and carry out parts of the plan related to their areas

However, the Board of Trustees states now, based on the premise that one authority is preferred to several, that it will assume the obligation to construct and operate the necessary facilities or such parts thereof as are not done by other agencies within the District.

The Board of Trustees now proposes that as of about July, 1960, it will issue revenue bonds in the amount required to complete detailed construction plans, and to carry out the construction or parts thereof not handled by others. It will establish equitable rates so as to produce the budget requirement for bond service and operation.

It is proposed that the pollution abatement facilities will be in operation in 1963

("Statement by the East Side Levee and Sanitary District to the Surgeon General for March 4 1958 Meeting called in St. Louis under Federal Water Pollution Control Act is an attachment to the original copy of this transcript.)

MR. GROSS: Thank you Mr Lischer.

As was indicated by Mr Lischer three of the cities that lie within the East Side Levee and Sanitary District, namely, Granite City, Madison and Venice, have separate outfalls, and they were invited here today. I will call upon you in that order if you have representatives.

Granite City?

(No response.)

Venice?

VOICE FROM THE FLOOR: Pardon me I may say the Mayor of Granite City is in the hospital The Mayor of Madison is sick I don't know where the Mayor of Venice is.

MR. GROSS: That's about 100 percent.

DR. LEE: I'm not sick; I'm healthy. I'm Mayor of Venice.

There's a couple of plans under study right now, and the plan most practical and feasible to the City of Venice will be put to the voters of Venice when it is done.

Thank you.

MR. GROSS: Next is Hartford, Village of Hartford.

MR. CORLEW: My name is Corlew. I am representing the Village of Hartford.

The Village of Hartford, I think, is rather unique in that they have so far followed and are a little ahead of the schedule set up by the State Sanitary Water Board. Funds are on hand for construction, and we expect that construction will be completed by the end of this year.

(Mr. Corlew's written report is as follows:)

"In compliance with your letter of February 3, 1958, the Village of Hartford has requested that we represent them at the meeting and present the following report:

"Plans for primary treatment of the dry weather flow of the combined sewer system have been reviewed by your office and are being revised in accordance with your recommendations.

"Funds are on hand for construction.

"Negotiations are in process for the plant site and necessary easements. An offer, approved by the local representative, has been submitted to the home office of the Sinclair Refining Co.

"Bids for construction will be taken about 30 days after the site is purchased.

"The proposal allows 60 working days for completion of construction after award of the contract, so the project should be started by July 1, 1958 and completed by November 1, 1958, subject to floods, strikes and delays in equipment delivery.

"Very truly yours,

"FLAGG & CORLEW, ENGINEERS

"M. B. CORLEW"

MR. GROSS: The Village of Monsanto's consulting engineer, Joseph W. Goldenberg, wished to leave on other work and asked if we would present the statement for that village.

"This report presents the accomplishments and plans of the Village of Monsanto in providing an adequate system of sewers adaptable to the segregation of sewerage and the ultimate treatment of certain wastes to avoid pollution of the Mississippi River.

"Background: The village population consists of approximately 350 residents plus 5000 non-resident employees of industry located within the village. It is quite evident that the sewerage system primarily carries industrial waste. Knowledge of the industries located within the village together with some information concerning their processes and operations make it quite evident that the sewers handle fairly large volumes of spent cooling waters.

"The village problem to date has been in providing adequate sewer capacity to its industries. In 1952 a firm of engineering consultants was engaged to prepare a "Report on Existing Sewerage System, Including Pumping Station and Recommendations for Expansion". This survey included information concerning existing flows and future projected increases. Accordingly, a tentative schedule for construction in order of precedence for maximum benefits was established.

"Accomplishments: Several sewer projects were constructed since the completion of this survey. The village has maintained contact with the industries and is somewhat familiar with their plans for improvements which would minimize the amounts of certain materials in their sewage which have created maintenance problems.

"We know that during the past several years three of our major industries have expended appreciable sums in this direction. The improved appearance of the trash racks and sewage at the pumping station attest to the partial success of their efforts.

"Preliminary plans have been completed for additional sewer construction. These plans have been prepared to supplement and adapt our present system to provide for the collection of segregated sewage at the respective industries. We feel that this will provide necessary capacity as well as flexibility for the future economic treatment of certain wastes.

"Until the present time the village has depended on the engineers and chemists of its industries to provide information concerning their work in reducing certain wastes which might be objectionable.

"Plans For Future: Because of the industrial nature of the village, our problems are somewhat different than those of the average municipality where the separation is between sanitary wastes and storm water. Of necessity, the village sewerage problems are also the problems of its industries.

"As soon as definite limits have been established for the St. Louis Metropolitan area, the Village of Monsanto, with the assistance of its industries, will co-operate with all concerned in abating the pollution of the Mississippi River. Meanwhile, study and planning will continue toward this end. The village does not expect undue difficulties in obtaining right-of-way or financing and would expect to meet the time table established by its neighbors."

South Roxana sanitary district has no sewers that they plan to incorporated sewage treatment with the sewers when planned.

Is the Wood River Drainage and Levee District represented?

MR. STEVENS: I have nothing to report. Our organization, being a little bit different from the East Side Sanitary District, we are not obligated for the sanitary sewage. It is our obligation to the river after it is delivered to us so about that we have nothing to say.

MR. STEIN: Pardon me, sir, would you mind giving your name?

MR. STEVENS: I am Wilbur F. Stevens, District Engineer for the Wood River Drainage and Levee District.

MR. GROSS: Has Mr. Hunter of Union Starch and Refining come in?

(No response.)

Apparently not, but he has acquainted us with the installation of two sewage tanks, and they expect in 1958 to complete installation of a continuous filter, which will greatly reduce the escape of starch and other high B.O.D. wastes.

Unless someone has been overlooked, that concludes the invitees from industries and municipalities.

Has anyone been overlooked?

MR. KRAFT: The City of Wood River, last but not least.

MR. GROSS: I'm sorry, a representative of my own home town.

MR. KRAFT: My name is Kraft, the City Manager of Wood River.

I wish to make this statement on behalf of the City Council.

I might just add that Mr. Stevens also doubles as our city engineer. That is perhaps why you forgot about us.

I wish I could report that we are making progress as our neighboring citizens of Hartford. Unfortunately, we have not yet reached that happy state of affairs as yet. However, let me read my report.

Wood River is a city of approximately 12,000 and discharges roughly 1,000,000 gallons per day effluent into the Mississippi River from a combined sewer system.

The City of Wood River reports the following progress with regard to the pollution abatement cooperative program prepared by the Advisory Committee of the Bi-State Development Agency:

(1) The corporate authorities have met with representatives of several consulting engineering firms, qualified in the field of sewage treatment and disposal, and have discussed with each firm the terms and suggested scope of a preliminary engineering report. In the near future, perhaps within the next month, the city expects to engage a consulting engineer to prepare a preliminary engineering report on the treatment and disposal problem.

(2) The city has already been in contact with the regional office of the Community Facilities Division, Housing and Home Finance Agency, relative to the city obtaining a planning assistance loan to finance the preliminary engineering. Application for this loan will be made concurrently with the hiring of a consulting engineer. The financing of the engineering report will be contingent upon the city receiving a planning assistance loan.

(3) Site selection for a treatment and disposal plant, owing to the topography and the developed nature of the sites imposes some problems. However, the city engineering department has been engaged in investigation and evaluating land favorable, by location and topography, for the location of a treatment and disposal plant. Preliminary discussions with property owners have been held. A tentative site for the location of a plant has been selected and will require the final evaluation of the consulting engineer that the city has engaged.

Although the City of Wood River has not met the time schedule on which certain phases of engineering, et cetera, were to be accomplished it endorses fully in principle the goal to which the cooperative effort is directed. Owing to an accelerated program of public improvements in the last six years to which bond funds have been applied, the city is faced with a limited G. O. bond capacity of $600,000 at the time of this writing. In addition to the limited bond capacity, there is yet outstanding revenue bonds in an amount of over $1,000,000.

The city presents this financial background by way of indicating the serious practical difficulties involved in complying with the schedule of priorities developed by the Advisory Committee. Particularly, the city is concerned about the feasibility of having a treatment plant in operation by December 31, 1961.

We intend to bend every effort to get our preliminary engineering report, and I think we can say we are faced with many of the same difficulties as the City of Alton, and very definitely the statement that

Mayor Day made regarding the financial situation, and the selling of this to our citizens will be a problem and we intend fully to face up to that problem.

Thank you very much.

MR. GROSS: Thank you.

Has any other local governmental unit been overlooked?

Any industry been overlooked?

If not, on behalf of the Illinois Sanitary Water Board, we wish to thank all of you for your intelligent attitudes and your willingness to discuss with sincerit these problems.

MR. KLASSEN: That presents our presentation of this section.

MR. STEIN: Thank you, Mr. Klassen.

At this point we should like to call on Mr. Happy of the Missouri Division of Health to talk on the adequacy of measures taken toward abatement of pollution and the nature of delays as it relates to the State of Missouri insofar as the cities and industries are concerned.

MR. HAPPY: Mr. Chairman, I shall again call upon Mr. Jack K. Smith of the Division of Health to present the statement.

MR. SMITH: The City of St. Louis became surrounded by small corporate communities with the result that control of the drainage area discharging through the corporate limits could not be gained by annexation. This fact was obvious prior to 1940. Growth of the Metropolitan Area continued at a rapid pace through the 1940's with most of the population increase occurring in St. Louis County. Several municipalities adjacent to the City of St. Louis arranged by contract to discharge storm and/or sanitary sewage flow through the St. Louis sewers. During this period other incorporated communities lying farther to the west constructed sewers and sewage treatment facilities, discharging treated effluent to Maline Creek, River Des Peres, Gravios Creek, and Cold Water Creek. With continued growth and the development of subdivisions outside corporate areas it became apparent by 1947 that an over-all coordinated effort was needed to provide for the collection and treatment of sewers. Conditions in St. Louis County were further aggravated by the fact that in many areas soil structures were not suitable for satisfactory development of individual subsurface waste disposal systems. During this development period many subdividers were encouraged to provide community collection systems established under home owners' agreements in order that the public health aspects of the environment will be protected in the immediate vicinity of the development.

By 1948 there were approximately 130 separate sewage treatment works in St. Louis County. Even though complete sewage treatment plants were installed to serve these subdivisions and municipalities, the effluents from the plants adversely affected the receiving stream to such an extent that nuisance conditions existed. State and county public health officials recognized the need for a coordinated system of trunk sewers as the logical solution to abatement of pollution of streams within St. Louis County. From the first, it was recognized that at least 4 major trunk systems would be required in addition to those sewers flowing through the City of St. Louis. Since some 142 political subdivisions were involved, the need for a super-imposed sewer authority was obvious. The St. Louis County Health Department, as an agency of the Missouri Division of Health, and the Division of Health encouraged the enactment of legislation to permit the planning and construction of the complex trunk sewer system. As a result of this encouragement, a sanitary sewer and surface water drainage committee was established in St. Louis County. The work of this committee resulted in the appointment of a board of freeholders, whose duties were to prepare a plan for a Metropolitan Sewer District. The plan was presented and on February 9, 1954, the citizens of St. Louis and St. Louis County adopted the plan. Under the plan the Metropolitan St. Louis Sewer District, a chartered subdivision, was authorized to take over existing sewer facilities, to construct and control additional facilities, and was made responsible for the policing of streams and the control of pollution within the District. Until the formation of the Metropolitan St. Louis Sewer District, the Division of Health of Missouri, as a water pollution control agency, recognized the difficulty of any attempt to require comprehensive planning toward the interception and treatment of sewage from the Metropolitan Area. In reviewing Division of Health records it is interesting to note that in 1943 the U. S. Public Health Service questioned federal participation in completing sewer systems in defense housing areas due to the lack of an over-all county plan toward the interception and collection of sewage. Several of the projects did not receive federal assistance toward completion and at least two of them are to date without sewer service. As a followup of the Missouri River Basin pollution abatement plan, a cooperative approach by the States of Illinois and Missouri was agreed to and published in the 1954 Mississippi River Water Pollution Investigation. On November 7, 1955, the Board of the Metropolitan St. Louis Sewer District was advised through its executive director that sewage treatment would be required in the not too distant future and further advised to consider future treatment in all design and construction work undertaken. On July 17, 1956, the Illinois Sanitary Water Board, the Missouri Division of Health, the Bi-State Development Agency, and the U. S. Public Health Service agreed on the establishment of target dates for the reduction of pollution of the Mississippi River. The following schedule was established:--I will not repeat that schedule, it's been mentioned several times.

As agreed, the Division of Health informed the Metropolitan St. Louis Sewer District of this schedule on August 13, 1956. On November 20, 1956, the Metropolitan St. Louis Sewer District was again advised of the necessity to reduce the pollutional load to streams in the St. Louis area by the Division of Health. A recommendation was submitted for the inauguration of an educational campaign to assist industry in reducing the amount of waste discharged to the Metropolitan St. Louis sewers. On December 5, 1956, the Division of Health was advised that the District has been unable to take any steps toward the abatement of pollution. On June 25, 1957, the Metropolitan St. Louis Sewer District was again informed regarding the established schedule for abatement of pollution in the Mississippi River and requested to advise regarding progress toward meeting the schedule. On July 16, 1957, the Division of Health was informed by the executive director of the District that an estimate of the cost of making an engineering study would approach $500, 000 and that the District was not in a position to advance the sum at this time for such a study. It was further reported that consideration was being given to requesting a loan for the study from the Housing and Home Finance Agency, but that it would take a minimum of 18 months to complete such a study. An ordinance had been adopted by the District governing the use of sewers and an industrial committee which assisted in drafting this ordinance was encouraged to institute studies of their waste in an effort to minimize the pollutional load on the Mississippi River and to avoid, where possible, the necessity of preliminary treatment before discharge into the District's sewage facilities.

At least one industry was reported to have engaged in a research program of this nature. On August 29, 1957, S.C.S.S.B.25, 69th General Assembly of Missouri, became law. This Act relates to the pollution of waters of Missouri, which may be detrimental to public health and welfare, providing for the prevention and regulation thereof and imposing penalties to have failure to comply with provisions of this Act or regulations adopted thereunder. I would like to read at this time Section 2 of the Act, which gives the philosophy of the law:

> "Inasmuch as the people of the State of Missouri are dependent upon the rivers, streams, lakes and subsurface waters of the state for public and private water supply and for agricultural, industrial and recreational uses, it is declared to be the policy of the state of Missouri to act in the public interest to restore and maintain a reasonable degree of purity in the waters of the state, and to require, where necessary, reasonable treatment of sewage, industrial wastes or other wastes prior to their discharge into the waters of the state."

I would also like to mention at this time the training programs carried on by the Division of Health.

To better improve operation of our sewage treatment facilities, such schools have been held in the Metropolitan Sewer District.

I would also like to mention the annual waste reduction conference held at the University of Missouri, and to a large extent the contribution made by industry in such conference in sharing with others the information they have gained through their studies.

In August, 1957, the Illinois Sanitary Water Board and the Missouri Division of Health determined that progress toward abatement of pollution in the Mississippi River was not progressing as rapidly as necessary. The two-state water pollution control agencies jointly requested of the Surgeon General of the United States Public Health Service that this conference be held for the purpose of determining the adequacy of abatement activities in the Metropolitan St. Louis Area.

Are there any questions?

Mr. Klassen?

Mr. Poston?

Mr. Kinsey?

MR. HAPPY: As Mr. Smith has indicated in his statement of the Missouri Division of Health, the Metropolitan St. Louis Sewer District was in charge of the sub-divisions and was authorized to take over existing sewer facilities, to construct and control additional facilities, and is responsible for the policing of streams and the control of pollution within the area of the District.

I would therefore like to call upon the Chairman of the Board of Trustees of the Metropolitan Sewer District, Mr. J. E. Williams, for a statement, with the suggestion that he consider extending an invitation to Mr. Frank Kriz, President of the St. Louis Board of Public Works, for a statement from a representative of the City of St. Louis, with particular reference to the disposal of ground garbage now going to the Mississippi River.

MR. WILLIAMS: Mr. Chairman, I am J. E. Williams, Jr., Chairman of the Board of Trustees of the Metropolitan Sewer District.

I have a short message to read to you, Mr. Chairman, then I would like to turn our portion of this program over to our executive director and any other municipalities or representatives of the City of St. Louis that have anything to say. I would appreciate it if they would do it right after Mr. Kehr, please.

On behalf of the Metropolitan St. Louis Sewer District, I extend our greetings and sincere wish that this conference will result in a better understanding by all parties represented here of the problem at hand, and that a satisfactory solution will result.

In accordance with the usual procedure of like conferences the Metropolitan St Louis Sewer District has prepared a written statement which our executive director will read However, as Chairman of the Board of Trustees of the Sewer District, I would like to say that this statement has the approval of the entire Board of Trustees.

I would further like to emphasize that the Metropolitan Sewer District will be very happy to cooperate with all parties concerned in this problem

At this time I would like our Executive Director, Mr. Kehr, to read the statement which he has prepared.

Thank you very much, Mr Chairman.

MR. KEHR: Mr Chairman, gentlemen, I am William Kehr, the Executive Director of the Metropolitan St. Louis Sewer District.

When the Metropolitan St. Louis Sewer District was first created, it was faced with three distinct major problem areas. First, it was faced with the problem of providing adequate sewers for large segments of the District. These sewers were necessary to get sewage out of the streets, ditches, and open water courses where it created a serious hazard to the health of the entire population of the Metropolitan Sewer District -- a direct hazard which did not have interposed between it and the people affected modern water purification processes. Children literally played in sewage-laden ditches and waded through septic tank effluent on the way to and from school. The stench from these heavily polluted ditches was a disgrace to the community hampering development and destroying property values

The second problem facing the District was that of providing adequate drainage Many sections of the District were served by inadequate storm drainage facilities incapable of handling even moderate storms without severe water damage in low areas. Such inadequate facilities were general throughout the county and in certain areas of the city where relief sewers were badly needed.

The third problem was that of providing adequate treatment for the wastes from the District as a whole before their discharge into the Mississippi River. From its inception the District was aware of the fact that wastes from the Metropolitan Area were discharged without treatment into the Mississippi River. The Board of Trustees has been sympathetic to the need for treatment from the very beginning and has constantly weighed this need against other needs facing the District. This is evident from the fact that a high degree of treatment is proposed for wastes from the Coldwater Creek watershed.

Faced with these three major problems, a decision had to be made. The years preceding the creation of the Metropolitan Sewer District had been unusually dry. Although the subnormal rainfall had the beneficial effect of minimizing many of the storm water problems, it tended to increase to unbearable proportions the nuisance and public health hazard resulting from inadequate sewage facilities in many heavily populated areas. This situation had become so acute that construction of sorely needed homes was halted in many of these areas. Further, it was felt that, since the Mississippi River at St. Louis drains a substantial part of the nation and has a tremendous capacity for absorbing pollution, the sewage problem within the District was greater and more critical than that in the Mississippi River below St. Louis.

Under the circumstances, the Board determined that first priority should be given to the inadequate sewage facilities within the District by providing sewers where they were needed, by constructing trunk sewers which would remove the sewage from the open streams, and by operating as efficiently as possible the fourteen sewage treatment plants the District had taken over from various communities and sewer districts.

Simultaneously, the Board was faced with the problem of creating an organization -- an organization capable of maintaining over two thousand miles of sewers; an organization for planning, designing and constructing the needed sewers and sewage facilities; an organization for billing and collecting the revenue necessary to insure the operation of the District; in short, an organization for taking over and integrating systems which had formerly been constructed, operated, and maintained by over 100 separate agencies.

Due credit must be given those agencies for their cooperation and assistance, and for the trained employees and equipment which they furnished the District, for without such assistance this monumental job could not have been accomplished.

In the little over two years the District has been in full operation and in a position to construct sewers, nearly fifty subdistricts have been created. Many of these subdistrict projects are completed, others are under construction, and still others are nearing the point of construction. These subdistricts will include every major sanitary sewage problem in the County, although many of these projects will have to be undertaken in stages involving the creation not only of subdistricts but of sub-subdistricts, in order to solve the problems. Much time will be required before these projects will all be carried through to completion.

In the meantime, the District has not been idle relative to the waste disposal problem. It was necessary for the Board to provide by ordinance for controls over the use of the sewer system. The

District called for and received the best of cooperation from industries in the area. A committee consisting of representatives of various types of industries was appointed to meet with representatives of the District to review drafts of the ordinance to be considered. In this manner, an ordinance highly satisfactory for the conditions which exist in the Metropolitan Sewer District was adopted.

During the course of the discussions, industry was requested to make studies of their wastes, not only for the protection of the sewer systems which serve the District but also to determine in advance whether their wastes would create problems when sewage treatment was provided for the area. Because of the possibility of critical conditions occurring in the river, industry was asked to review their operations and to remove as much of the organic wastes going into the river as possible. That industry has cooperated with the District is clearly evident from the attached letters outlining steps taken by several major industries in the area.

I might say, Mr. Chairman, that we have some six or seven letters from major industries in the area. After we had decided to include these areas, time did not permit the securing of more letters of this type. I am convinced we could have gotten many times this number. And I would like to say this with reference to industries, that they have cooperated wholeheartedly. We have no instance in which an industry has refused to work with the District in connection with our program. These letters represent only a few examples of the type of cooperation the District is receiving from industry. The committee appointed by industry is continuing to function and has pledged its full cooperation in solving the problems which will inevitably arise when treatment is provided for District wastes. The District will continue to work with industry to improve their industrial waste disposal practices and reduce the load on the Mississippi River.

The task of intercepting, collecting, and treating the wastes from the Metropolitan St. Louis Area is complex in the extreme. In addition to the area which drains to the Mississippi River, the District includes portions of the Coldwater Creek and Meramec River watersheds. That portion of the District which drains to the Meramec River is served by a sewage treatment plant of the activated sludge type whose capacity has recently been investigated and found to be adequate. However, in order to utilize its full capacity certain revisions in the air distribution system and sludge return system will have to be made. These are minor in character and the District plans to proceed with the changes.

Preliminary engineering plans have been prepared for the construction of a major trunk sewer and a complete sewage treatment plant of the activated sludge type in the Coldwater Creek area which drains north to the Missouri River. The amount of the bond issue has been determined and arrangements are being made for a bond issue to be presented to the voters.

The major part of the drainage from the District goes into the Mississippi River. Along the 22-mile stretch of the west bank of the river between the northern and southern boundaries of the District there are over 80 separate outlets which discharge into the Mississippi River. These include the outlets from the City of St. Louis.

I might say at this point that I have appended a map to this statement which shows the locations of these outlets. I'm sorry we don't have a map large enough for the audience to see. I'm sure it would be of interest to them. It would show them something of the complexity of our problem.

Each of these outlets must be studied individually to determine how and where interception should take place, to determine the volume of wastes to be intercepted, and to ascertain the characteristics of the wastes to determine whether any unusual condition exists which might necessitate special consideration. The location of the interceptor or interceptors which will conduct the sewage to the point of treatment is in itself a major decision. A study must be made to find potential treatment plant sites, and economic studies must follow to determine how many plants should be built and where they should be located. Finally, studies must be made to determine the type and degree of treatment which must be provided. Preliminary consideration indicates that as many as eleven plants might be most economical, or as few as one. A thorough study of the various possible combinations should be made to find the best and most economical solution. An outline of the proposed study and report is attached as Appendix C.

This over-all problem is complicated by a proposed flood control program for which engineering plans are now in preparation. A committee consisting of representatives of the Corps of Engineers, the City of St. Louis, and the District, has been set up to coordinate the various phases of the program.

I might interpose at this point that this committee was set up some time ago early in this period of study for the proposed flood control program. The committee has been active in the planning throughout this study period and we have been assured by the committee that every effort will be made to coordinate or to cooperate with the other agencies involved in order to insure that the works will be built without any overlapping of effort or overlapping work, and that they will be constructed at the lowest possible cost. It is not our intention at all to wait until a flood control program is done and then go in and tear up part of their works in order to get our own program in. This can be avoided certainly by study early in this period prior to construction, and we certainly will follow through in that connection.

If these flood control measures are undertaken and carried through to completion, some of our problems may be simplified. On the other hand, if the flood control program should not be authorized for construction, our problem becomes somewhat more complex and most costly.

With reference to District plans for the future, we offer the following time schedule for your consideration.

1. Meramec River Watershed: The changes and improvements to the sewage treatment plant serving this area are planned for this year. As soon as these revisions have been made and the plant operation can be studied, consideration will be given to the future needs of the area.

2. Coldwater Creek Watershed. A bond issue is definitely planned for this year. If successful, construction could start early in 1959 with construction of the treatment plant facilities completed by January 1, 1961. That is, of course, on the assumption that the bond issue is successful. The trunk sewer probably would require an additional six to nine months for completion. It involves some eight miles of trunk sewer ranging in size from 72 inches down to about 36.

3. Mississippi River Watershed. The District has filed application with the Housing and Home Finance Agency for a loan with which to undertake the previously described preliminary engineering studies. It is estimated that the studies will require two and one-half years and will cost $270,000. It is anticipated that the money necessary for the studies will be available by July 1, 1958. The studies should be completed by January 1, 1961. At least one year would be necessary to review the report, decide on the alternate plans presented, and complete arrangements for a bond issue. It is anticipated that such an issue could be presented to the voters in the spring of 1962. If successful, construction plans would be immediately authorized, and construction of the first units of the project could begin about january 1, 1963. On the assumption that construction would require four years, the last unit would be placed in operation about January 1, 1967.

4. Industrial Wastes. The District will continue its program of working with industries in the area to reduce to a practical minimum the industrial waste load on the stream. It is anticipated that this work will be substantially complete by January 1, 1961. Additional time might be necessary for those industries where preliminary treatment may be required before permitting discharge into District sewers. I might say this other one thing, that it has been proposed by representatives on this committee that the committee meet regularly on a quarterly basis to discuss the progress that is being made and also to consider special problems that might arise, and as part of their program they plan to have representatives of public health agencies and water pollution agencies meet with the group in order that they may be

fully apprised as to what we are doing and what we have accomplished in this industrial waste and pollution reduction program.

Thank you, Mr. Chairman.

(Which said letters are as follows. plan and report are an attachment to the original copy of this transcript.)

Mr. Kehr's Statement
Appendix A (1)

KREY PACKING COMPANY

St. Louis, Missouri

February 27, 1958

St. Louis Metropolitan Sewer District

Gentlemen:

I have been informed through Mr. Brown of the Associated Industries of Missouri that a statement of progress in sewage disposal is desired as a matter of record.

Starting in 1940, installation of improved type grease traps were our first step in the direction of improvement in our sewage system, followed by a program of drain and sewer line relocation to permit routing of sewage through the improved grease traps.

In February of 1952, a grease recovery and treatment system was installed using the air flotation principle with means of proportioning chemical coagulant to achieve further clarification. This system was installed in series with the grease traps and has been quite satisfactory.

In our operations it is considered an economic necessity to prevent fats and protein from entering the sewage system and much emphasis is placed on any program to achieve this end.

Our present system and operating procedures are based on sound economic considerations, directed on a course to eventually meet the standards set up by the District.

/s/ Lowell E. Joslin

Lowell E. Joslin
Mechanical Superintendent

LEJ:eh

Mr Kehr's Statement
Appendix A (2)

MALLINCKRODT CHEMICAL WORKS

Second and
Mallinckrodt Sts
St Louis 7, Mo

February 25 1958

Metropolitan Sewer District
506 Olive Street, Suite, 201
St Louis 1 Missouri

Gentlemen:

With the approaching meeting on river pollution scheduled for March 4, 1958, it will interest you to know that our Plant will proceed with a sewage testing program starting sometime in April with the thought of taking corrective measures to eliminate, neutralize or further dilute any objectionable chemical concentrations that may be in our effluent.

We have a portable set-up with which we can take continuous representative samples over either an eight-hour or twenty-four hour period including a recording pH meter At the present time with no previous experience in this work, any scheduled testing procedure will be subject to change. If you know of other industries contemplating similar installations we would be happy to cooperate with them either in furnishing information we have accumulated or incorporating some of their procedures in our equipment

If representatives from industries are to attend this session, several of our engineers will be there

Yours very truly,

MALLINCKRODT CHEMICAL WORKS

s/ John G Moore

John G Moore
Vice President

JGM:lb

Mr. Kehr's Statement
Appendix A (3)

MONSANTO CHEMICAL COMPANY

Organic Chemicals Division
JOHN F. QUEENY PLANT
St. Louis 4, Missouri

February 25, 1958

Associated Industries of Missouri
Railway Exchange Building
St. Louis Mo.

Attn: Mr. Seldon Brown

Gentlemen:

This report presents the accomplishments and plans of the J. F. Queeny Plant of Monsanto Chemical Company to prevent pollution of the Mississippi River.

Background

The Queeny Plant manufactures approximately two hundred different products. In addition we handle several times this number of products as raw materials. Our wastes are diluted with fairly large quantities of process waste water; they are discharged to our sewers, which in turn empty into city sewers and thence to the Mississippi River.

Program

Beginning on January 1, 1956 Monsanto has assigned a chemical engineer who is familiar with plant products, manufacturing processes, and experienced in the manufacture of various products, to spend full time on the Air and Stream Pollution Abatement Program at the Queeny Plant. Monsanto encourages his attendance at seminars, conferences, and training programs at their expense. He has attended courses in this field at the Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.

Top management of Monsanto has asked that every new project for installation give consideration to waste disposal and incorporate plans for handling pollution problems. For example, during the past year we built a new department and incorporated plans for the manufacture of 20^{o} Be' Hydrochloric acid instead of scrubbing the gases to the sewer.

A number of older manufacturing departments were constructed during periods of growth when expansion was too rapid. Because of emergency conditions, we were unable to digest all of the potential sources of pollution which accompanied this expansion. In such cases we attempted to revise the process and operate under conditions more favorable to reduce waste products formation. Much of our waste is sent to a toxic dump

We continuously survey all manufacturing departments as to quantity and type of materials leaving the process as waste. Study of these processes makes for better waste pollution control.

Another difficult problem was the continuous sampling of our waste material. Our sewers are deep and not readily adaptable to continuous sampling and flow measurements. Our waste streams join outside of the Plant and then run in a sewer located in the middle of a public street.

We have recently completed the installation of a new manhole on our out-going stream with equipment for flow measurements and continuous sampling. No commercial sampling equipment was available so we had to devise our own continuous samplers

Our Plant has been developing projects to reduce our wastes. Twenty-two projects have been completed in the past two years We have cooperated with the Metropolitan Sewer District and state regulatory agencies in every way.

Future

We plan to continue our work of improving operations and reduce the amount of waste to the river.

Yours very truly

s/ Joseph F Nemeth

Joseph F Nemeth
Pollution Control Engineer

aeh

Mr. Kehr's Statement
Appendix A (4)

THE PROCTER & GAMBLE MANUFACTURING COMPANY

East Grand Avenue & Second Street St. Louis 7, Missouri

February 28, 1958

Metropolitan St. Louis Sewer District
506 Olive Street
St. Louis Missouri

Gentlemen:

Generally, waste leaving premises of The Procter & Gamble St. Louis Plant can be not only a pollution problem but also a waste of valuable material which might be reprocessed therefore, a continuing program of monitoring the plant effluents has been in effect.

In order to reduce the volume of waste leaving the plant, cooling towers have been installed so that a maximum amount of the slightly contaminated cooling waters are recirculated and a very minimum is discharged to the sewers and eventually to the river. In order to keep the solids concentration in this closed system down to a level which will not cause scaling in heat exchangers a certain amount of bleed-off to the sewer is necessary This so-called blow-down from various cooling towers passes through sedimentation chambers with detention times varying from 1 hour to 24 hours Most of the settleable, floatable solids are removed and recovered prior to discharge of the waters to the sewer

Acids are utilized in some of the manufacturing processes. Practically none of these acids find their way to the sewer However, inadvertent spills are possible which could result in damage to the sewers. Wherever there is a likelihood of such accidents, facilities are generally provided to impound such spills until the acid can be either recovered or neutralized and discharged to the sewer system.

The Procter & Gamble Company has worked closely with the Metropolitan St Louis Sewer District in drafting the ordinance of the disposal of industrial waste to the municipal sewer system. This ordinance will give industry the option of giving its waste to the district for treatment, if and when further treatment is ever required. It is generally far cheaper for industry to pay the municipality to treat its waste in a large central plant than to handle waste in many individual small units built by each industry on its own premises

Very truly yours
s/ C E. Eberle
C E Eberle
Plant Manager

Mr. Kehr's Statement
Appendix A (5)

RALSTON PURINA COMPANY
Checkerboard Square
St. Louis 2, Missouri

February 24, 1958

Mr. Seldon E. Brown
Associated Industries of Missouri
2031 Railway Exchange Building
St. Louis 1, Missouri

Dear Mr. Brown:

Subject: Meeting to be Held March 4, on River Pollution

My superior, Mr. English, Manager of the Engineering Department, asked me to inform you on the nature of our sewage discharge here at 835 South Eighth Street.

We have several hundred people employed here in the office and mill. Accordingly, we do discharge sanitary sewage for this amount of people.

We use considerable water to cool various items in our plant, such as air compressors and stoker bearings. The discharge from these units is perfectly clear and pure.

We have a research laboratory around the corner on Chouteau Avenue in connection with our buildings here on Eighth Street. Once in a great while they will discharge mild acids but along with this goes copious quantities of their tap water, sewage, and condenser water so that in effect these mild acids are neutralized.

Accordingly, I would not think that we are causing any pollution to the Mississippi River outside of the fact that we are discharging sewage as are all the other industrial, commercial and residential buildings in this area. I would not think that any reasonable pollution law would affect Ralston Purina.

We are most anxious to cooperate and help you in any way we can. If this letter leaves any question unanswered, please get in touch with me immediately.

Yours truly

s/ C. B. Smith
C. B. Smith
Utilities Division Engineer

bs

Mr. Kehr's Statement
Appendix A (6)

ST. LOUIS INDEPENDENT PACKING COMPANY
A Division of Swift & Company

824 S. Vandeventer Ave. - St. Louis 10, Mo.

February 27, 1958

Mr. S. E. Brown
Associated Industries of Missouri
2031 Railway Exchange Building
St. Louis 1, Missouri

Dear Mr. Brown:

Referring to recent telephone conversation in regard to meeting that will be held on March 4, which has been called by the U. S. Public Health Department to consider the problem of pollution of the Mississippi River, and your request for information on what has been done in the packing industry in this regard:

While we cannot speak for the industry we can give you a review of our handling. St. Louis Independent Packing Company is saving and processing all products and by-products from livestock dressing operations in line with good operating practice. Rendering operations are conducted to salvage all possible tallow and grease. The protein residue is saved for Animal Feed, along with Blood and Tankwater, which is evaporated and dried. The Plant uses a catch basin to recover fats from normal wash waters, before they are discharged to the City Sewer.

Trust this statement will serve your purpose.

Yours very truly,

ST. LOUIS INDEPENDENT
PACKING COMPANY

s/ S. M. Weir, President

SMW:EB

MR. STEIN: Thank you, Mr. Kehr. Would you wait there to see if there are any questions?

MR. KEHR: At this time, I would like, if you don't mind to call on Mr. Frank Kriz, who I believe wishes to make a statement on behalf of the city, then as soon as he is over, I will be available for questioning, as well as Mr. Kriz.

Mr. Kriz.

MR. KRIZ: Mr. Chairman, members of the committee and gentlemen:

I have no statement to make in writing except to permit me, if you will, to discuss a matter of garbage.

We are in sympathy with your program, and I want to, on behalf of the administration, to commend you for the time and work that you have put into this effort, and we hope in the near future that you will solve all these problems and we will be there to help.

The matter of garbage, of course, is a special problem, and we are one of the contributors.

I was interested to see Mr. Stein, that he was surprised when somebody mentioned that we ground garbage in St. Louis and dumped it into the river. That, of course, has been going on for years, and it is going on in other cities, except other cities have available other facilities whereby this ground material can be processed through a sewage disposal or treatment plant.

Now, the matter of garbage came up for serious consideration in 1952. Prior to 1952, the city ground and sold much of the garbage. Most of it was sold, I would say, about 70 percent of the garbage collected was sold in the city to hog feeders, and in 1952, the State Legislature passed a bill which prevented the city from further sale of raw garbage to hog feeders. Therefore, we had a problem.

The problem was that our garbage grinders were obsolete and breaking down, because we didn't grind all the garbage at that time, and we had to act quickly to do something about the disposal in case our plant had broken down, and we, of course, think 150 tons or 300 tons of raw garbage is a problem, no matter where it is, whether it's in the river or in the alleys or in the street. Therefore, we immediately considered other matters, such as making compost out of garbage, also hog feeding, and we looked around for landfills. The landfill situation in St. Louis is bad. There are no open areas where we can operate a landfill for the disposal of the garbage and certainly the county, St. Louis County does not want our garbage in the county anyway. They have their troubles of their own.

So we also explored the idea of making compost and we contacted other cities and there are very few today that are producing any fertilizer or hog feed out of ground garbage. It doesn't appear to be successful, and they don't happen to have any guarantee that anybody is going to buy fertilizer. So that we concentrated on a new grinding plant, and we included a certain amount of money, $250,000, for the expansion of our grinding facilities. These have been completed and we recently put them in operation -- this spring -- this year. So that we are now grinding practically all the garbage that we collect, and it is collected separately from refuse in St. Louis, and the garbage load, I might say, in the past ten years has reduced from about 80,000 tons a year to about 60,000. We believe this is due to the fact that our food stores are packaging and canning more material and we don't get the amount of waste from vegetables and other food products that we did before.

Another reason is that is the past ten years the city, the homes that are being built in the city and older homes are being equipped with garbabe grinders, so that part of the garbage, some of that garbage is merely transferred from our grinding plant through the sewers and it now flows through all the sewers rather than one sewer.

We collect garbage three times a week. Our load in the summertime is heavy sometimes over 300 tons a day, and that is quite a pile of garbage to get rid of. So our plant is located within a mile of the river, and we dump the garbage and wash it with a heavy flow of water into the large sewer, a 30-foot sewer, which we call Mill Creek Sewer, and it ultimately is deposited into the river.

We don't like the idea. We would like to do it some other way, but we have no other way at this time. We have no funds for processing the garbage any other way, and we believe ultimately the solution of our problem is the same solution that the Sewer District will have when they at some future time, as Mr. Kehr pointed out, build a sewer-disposal treatment plant and I think when that time comes that the matter should be considered and the garbage properly ground and dispatched to a treatment plant to intercepting sewers.

Now, that is a problem for the city and the Metropolitan Sewer District to work out, and I believe it can be done very easily and economically and we should be in a position to stop polluting the Mississippi River.

Thank you.

MR. STEIN: Thank you, Mr. Kriz. I wonder if you would mind waiting there on this question and see if we have some comments or questions.

Mr. Klassen?

MR. KLASSEN: Yes, I have one question on the garbage.

Did I understand that all of the garbage is taken to one place for grinding?

MR. KRIZ: Yes, sir.

MR. KLASSEN: Undoubtedly you have considered the possibility then of having some type of garbage digestion or treatment plant at that site. Has that been considered as a means of removing it from the sewer?

MR. KRIZ: No, we have not. We dump it in a pit and grind it. Of course, we have equipment to pick out the cans and iron and what not, but we have to pick the garbage for concrete and otherwise material that might damage our grinder, but the garbage is ground very fine, into a sort of soup, and is flushed with a heavy flow of water continuously into this sewer, and if you go to the outlet of the sewer all you will see is a sort of grayish flow out of the sewer, and you won't see any large lumps of garbage in that flow, I don't think. I have observed it, but that is not saying that we are not contributors to the pollution. We are for your program, and we are partial contributors.

MR. STEIN: Do you have any more questions?

MR. KLASSEN: No.

MR. HAPPY: I have a question. I might direct this to you, Mr. Kriz, or to Mr. Klassen:

Is there any incidence of municipal or community garbage grinding on the Illinois side?

MR. KLASSEN: Not that I know of.

MR. HAPPY: Is there any instance to your knowledge of any disposal of stockyard wastes, either bedding, manure, or punched manure, untreated, in the Mississippi River?

MR. KLASSEN: Undoubtedly there is from some of our stockyard installations although we haven't the details of that.

MR. STEIN: Mr. Kinsey.

MR. KINSEY: No, I have nothing.

MR. STEIN: I have a comment, too.

The reason I made my remark was not so much surprise at the fact that garbage was being put in the sewers, but that garbage was being put in and then discharged to the river without treatment. Now, that is prompted by a statement made here by Mr. Happy and Mr. Smith that a large portion of the complaints on the Lower Mississippi River pollution have been the result of visible evidence of this garbage discharge. I think it's quite a problem, quite a commentary, I might say, that in a city of this size what is done is that the total garbage is collected, ground up and just put into the river without any further treatment, just grinding.

Now, I also may say that in various of the other conferences we have had, comparable situations have obtained, generally the conferees have recommended that this practice be discontinued rather rapidly. Now, I wonder if you have any plans underway thinking in terms of an alternate method, because we are thinking in the terms of the construction schedule proposed here. It's going to be quite a while before that garbage would be receiving treatment.

MR. KRIZ: We don't have any plans at this time, Mr. Stein, because any plan we go into to process 300 tons, our maximum daily output, would require an enormous plan, and it would require also an enormous amount of money at this time, and we just don't have the funds available at this time.

I don't know what we can do. Maybe you gentlemen can recommend something that might partially solve the situation. Maybe we should also take a trip down the river and see what is going on.

MR. STEIN: Mr. Kriz, I might point out that I think the group, if I can judge from the other conferences, have generally considered this when the conferees make their recommendations as to the disposal of garbage, and I would not doubt that they may very well consider this and come up with a recommendation for this problem in this area.

Do you have anything to say, Mr. Poston?

MR. POSTON: No, I think not.

MR. KRIZ: Mr. Stein, I don't know of any other city that really treats garbage, I mean, partially. They either send it through a disposal treatment plant, they burn it or they bury it in the ground.

MR. STEIN: That's right.

MR. KRIZ: As I said, I believe the people would rise in arms around St. Louis because we don't have any clear-cut open areas to start a landfill dump, and they have trouble in the county even opening a rubbish dump, and we have trouble with rubbish dumps too all the time, so it's just a question -- if we had these areas, that might simplify the whole thing.

MR. STEIN: Mr. Kriz, I recognize your problem. One of the basic problems we have here, and I think we recognize the problem in St. Louis, certainly the problem that Mr. Kehr has indicated, the concentration on your internal and local problems, and we are not minimizing that at all, but under the law we have an obligation for interstate effects. Now, if this garbage is creating nuisance conditions and affecting the interstate laws of the Mississippi River, I think we do have an obligation to look into it and perhaps come up with a recommendation. otherwise, I think we would be remiss in carrying out our function under the law.

MR. KRIZ: We will be glad to receive any recommendations and we would like to comply with them if we are in position to do so

MR. STEIN: Right. Thank you You may want to wait and hear this discussion, because if it does come up you may want to say something again.

Thank you.

MR. KRIZ: Thank you, sir

MR STEIN: Mr Kehr, would you want to come back?

Before I throw this open to these gentlemen, I would like to ask you a couple of clarifying questions, and that is in your statement where you talk about the Meramec River watershed You say "Changes in improvements to the sewage treatment plants serving this area are planned for this year."

Do you mean by that that the construction will be completed by January 1, 1959?

MR. KEHR: I might say this, as I pointed out earlier in my statement, the problem at the Meramec treatment plant is a relatively minor one. It concerns air distribution and sludge return facilities. It is not a major construction program, at least not at this time Now it may be that after this work is completed, and that after further studies are made, and some improvements, or some, shall I say, additions to the treatment plant may be necessary, that, of course, would take further time.

MR. STEIN: What I'm getting at, for clarifying the statement, if we could, say, for example, have a date. When we go away from here we find it much easier for communication and understanding if we can assign a date, because when we speak in terms of "this year" we may have a problem on communication and understanding.

Could you say that changes in improvement to the sewage treatment plant serving the Meramec River watershed area will be completed by January 1, 1958?

MR. KEHR: Yes. Wait a minute, 1959.

MR. STEIN: 1959, I'm sorry.

Now, also, could we say that if evaluation at that time indicates that further work is needed, that such further remedial measures will be put into effect if needed by, and you name, possibly might give us a particular date so we will have that lined up? Now, I know that very well may be a small problem, but I say this is just for clarification.

MR. KEHR: Well further remedial measures at the Meramec treatment plant would probably involve a bond issue and would take some time to plan and complete.

MR. STEIN: I see.

MR. KEHR: We do not anticipate them at this time. It would depend, I would say, upon further development of that area.

MR. STEIN: In other words, let me see if I understand this sentence: "As soon as these revisions have been made and the plant operation can be studied, consideration will be given to the future needs of the area." What you mean by that is that further work very probably will not be needed except as you get area growth?

MR. KEHR: That's right.

MR. STEIN: And you confidently expect that the changes and improvements will give adequate treatment facilities by January 1, 1959?

MR. KEHR: That's right.

MR. STEIN: Thank you.

Now, we have one more point.

With the Coldwater Creek Watershed, you say a bond issue is definitely planned for this year. Then I think in your remarks you mentioned July, possibly '58 Would it be possible to say that a bond issue will be -- do you have to go to the voters with that?

MR KEHR: Yes

MR STEIN: Well can we say then it would be put before the voters "not later than" -- to get a date?

MR KEHR: We have had some difficulty in securing a committee to work in the Coldwater Creek area We do not feel it would be advisable to arrange for the bond issue until a committee has been created and had an opportunity to shall I say acquaint the people of the area with the proposed program

MR STEIN: I understand what your problem is but the point, and we are not pressing you for at least I don't think I would for a close date or anything to be burdensome I think we again when we leave here and have the record unless we can have a definite cutoff date on some of this we are not sure if we are faced with a situation where we can check back and see if the recommendations are being complied with

MR KEHR: Well I think rather definitely we could say that the bond issue will be held this year that is prior to January 1st Now, if it's possible to get our committee functioning prior to July 1st so a vote could be held at that time why that will be done

MR STEIN: That is January 1 1959?

MR KEHR: Yes

MR STEIN: Now could we say that -- change this that construction will start "not later than" -- and then put another date there "not later than" -- you may want that somewhere late in '59 to give yourself some leeway?

MR KEHR: If the bond issue is not presented until late in the fall construction would be delayed accordingly I would say if the bond issue is successful that construction would start no later than July 1 1959

MR STEIN If construction starts on that date you can be completed by January 1 '61 or is that cutting it too fine?

MR KEHR: I think perhaps that the plant could be built within 18 months I put two years in there just for one thing That was a time limit that you had set for the area as a whole and I think we can probably meet that

MR. STEIN: Those are the clarifying things that I have.

Now. Mr Klassen, do you have any questions or comments?

MR. KLASSEN: I have no questions. I just wanted to make the comment on behalf of the State Sanitary Water Board of Illinois that we appreciated very much the positive thinking that went into this Board of Trustees, and Mr. Kehr, culminating in the actual scheduling of dates, which, of course we would like to see stepped up, but it is important to have this, because it is of extreme practical importance for scheduling work on our side of the river.

MR. STEIN: Thank you.

Mr. Kinsey, do you have any questions?

MR. KINSEY: I have no questions.

MR. HAPPY: I have no questions of this gentleman.

MR. STEIN: Mr. Kehr, I would like to ask the conferees some questions and possibly they may want to ask you a question.

In the light of the statements which were introduced, this schedule you have for the bulk of the work involving the Mississippi River watershed is somewhat beyond or lagging behind time set for it originally. Now in the light of the fact that a somewhat earlier schedule is proposed for Illinois and, of course, we recognize, I should say, that obviously one schedule would not be applicable to all communities, because that would be unreasonable that in the light of that, in the light of the other remedial work being done on the Missouri-Mississippi River Basin system and in light of the fact that the state and people of Illinois are going to receive the effects of a good portion of this pollution, I wonder if we can have some discussion on the appropriateness of the time schedule? I think on the key point possibly have the Illinois representative; I would like to call on Mr. Klassen?

MR. KLASSEN: The schedule that has been set up in this document?

MR. STEIN: Yes.

MR. KLASSEN: As I stated, we obviously would like to see the dates advanced. However, we certainly appreciate some of the time factors from a practical engineering standpoint that are involved, and not being intimately acquainted with the problems of the district as their own trustees and engineers are, I don't believe I am in any position to say "Why isn't this date set up?" or "Why isn't this date changed?" Frankly, we have got to be pretty much guided by what we feel is, and as evidenced here, a sincere desire on the part of the district to get this job underway just as soon as possible.

MR. STEIN: Do you have any comment to make on that, Mr. Poston?

MR. POSTON: In view of Mr. Kehr's statement for the Board of Trustees, I understand that there are up to 300 tons of garbage per day that are thrown to the river, and there was considerable comment both from those that took trips on the river and from the water plant downstream relative to the effects of grease probably from this garbage; there were also comments to the effect that industries might be required to make changes in their discharge of waste, maybe elimination of certain wastes from their sewers, and that would it be possible to incorporate some of these waste-producing processes, incorporate that operation at an earlier date, elimination of garbage and elimination of certain industrial wastes prior to or before the time during the planning and construction of this treatment works.

MR. KEHR: As to the garbage, that question could best be answered by Mr. Kriz. As he indicated, I don't believe he can give you a definite positive answer at this time.

With reference to the industrial wastes, I believe if you will refer to paragraph 4, there is a time set in this industrial waste program. It is a time that I feel would be reasonable and could be reached -- well, it is a reasonable time.

I would also point to the letters that are appended to the statement as Appendix A, which indicates some of the steps that industry has already been taking. Frankly, I think that some of the industries are pretty well complying with what we want at this time. Others, of course, are working on the problem, and where expensive preliminary treatment facilities may be necessary, it may be that additional time would be required, as I have pointed out, but, generally speaking, I believe that industry can by January 1, 1961 comply with, shall I say, good housekeeping practices.

MR. POSTON: This morning, the District Engineer, Colonel Schweizer, talked about the need for rapid cooperative planning, that construction of flood control works were underway, and I am wondering whether there's any possibility of stepping up this two and a half year schedule, or planning of sewage treatment works might not be a savings from the standpoint of eliminating or combining pumping stations with this other work that is currently going on.

MR. KEHR: As I pointed out in the statement again, the District has a coordinating committee. that is the District, the Corps and the city, have a coordinating committee working on this flood control planning. We have had since its inception. The District has constantly taken the position that the Corps in their planning should consider the possibility of treatment. It has been our understanding that insofar as the district office could, that they would cooperate with us. I'm not certain as to the significance of the statements that were made this morning. I certainly will arrange to confer with the Corps as soon as we can to get their interpretation of just what they meant by that, because certainly they are aware of this coordinating committee and the work that they have done.

MR. STEIN: Mr. Kehr, may I ask a question?

I'm a little puzzled by the two and a half year time that it would take to complete the studies or about 30 months in the light of the statement issued -- placed in the record by Missouri earlier, where they say, and I quote: "It is further reported that consideration was being given to requesting a loan for a study from the Housing and Loan Finance Agency, but that it would take a minimum of 18 months to complete such a study." Now, maybe we can have some clarification, perhaps the folks of Missouri want to comment on that, too, but there seems to be quite a time spread there, almost double.

MR. KEHR: I would be glad to have the comments from Missouri.

MR. SMITH: I think, as we indicated, your statement was a minimum of 18 months, and possibly further study on your part, and further consultation with the engineers, would reveal it would take a longer time.

MR. KEHR: That is true. The works are very complex, as I pointed out. It involves some 22 miles, roughly, of interceptor sewer, the interception of waste from some over eighty outlets, the construction or the determination of the number of treatment plants and where they should be located, all of which involves not only a single study but a series of studies, because they have to determine, first of all, whether eleven plants or ten plants or nine plants or so on down to one, is the proper and economical answer to the problem, and then having determined that, I have no doubt that they will come up with several alternatives to present to the Board, which will require further study, and it is for that reason that the time schedule has been set as it has. If there's any way of speeding that up, we certainly would be most happy to consider any suggestions or ideas relative to that, but without conferring with the consulting engineers, I don't believe we would be in a position to state at this time that we could shorten that period of preliminary study.

MR. STEIN: Can we call on Mr. Klassen?

MR. KLASSEN: Not on this particular subject, but if --

MR. KINSEY: Mr. Kehr, I notice in your time schedule for the Mississippi River Watershed that you include a period of one year after the consulting engineers' report is sent out for your review and decision as to which of the alternates you want to adopt. Wouldn't it be true that your staff would undoubtedly be working rather closely with the engineers during the entire two years that they are working on this report, and they would be very familiar with all the details of the report as the report was being prepared, and I wondered why it wouldn't be possible for you to work on your arrangements for your bond issue during the same time the consultants were working? Of course, you couldn't put the number of dollars in there, but you could have a preliminary figure. I wonder if you would discuss that just a little more in trying to let us understand why that one year of time must elapse for your own work with respect to studying the engineers' report?

MR. KEHR: First of all, you wouldn't be able to compare the last plan or the last alternate and the other alternates that appear feasible until the last one is completed, you wouldn't know that, and I would not anticipate that the Board would be in a position to consider the various alternates until after the study is complete, although they would have many details concerning them, because, remember, that in addition to the initial cost, there is also the annual maintenance and operating costs, and I hardly believe it would be feasible to consider those, and to make a final decision.

Now, within a very short time it is entirely possible that a single alternate might stand out, as the only way, only practical way, but it's been my experience that on a complicated and complex project such as this one would be, that there is no single alternate, that there are a series of alternates, and from that series one must select the best, and I believe that it will take time.

Actually, my timing on that would be this: that it would require the Board perhaps six months to complete their studies, and perhaps to ask the engineers to go further into detail or make subsequent studies concerning a particular alternate which appeared favorable to them, and the other nine months, six to nine months, would be actually making arrangements for the bond issue.

There are certain procedures that are established in our plan which are time consuming, and I just don't believe it would be feasible --

MR. KINSEY: You mean with respect to issuance of bonds?

MR. KEHR: Yes, that is correct, holding of a bond issue election.

MR. KINSEY: I understand that. Thank you very much.

MR. KEHR: And I don't think it would be feasible to shorten it.

MR. POSTON: Would it not be possible that your engineers worked with your consulting engineers so that at the completion of your engineering report you would be in agreement with them and you would not require this year for approval of these plans? If you spend two and a half years getting your engineering report out, if at the end of that time then you spend another time in deciding whether that is a good plan or not, would it not be possible to keep current on what is going on with your engineering report?

MR. KEHR: It would be possible to keep current, but as I pointed out, the last alternate wouldn't be completed until the very last phase of the engineering study, and because of that, you could not make any decision or come to the Board with alternates for them to consider until the study is actually complete.

Finally, I didn't allocate a year for that decision, I allocated only six months, which I feel like is a reasonable time, where you have projects of the considerable magnitude such as these will be. You can't just look at them and say, "Well, this one is best."

MR. STEIN: I think we can go on.

The one area that seems just on its face to be a little long is that first 30-month period, particularly in view of the minimum of eighteen months. Now, commensurate with other jobs, other planning jobs, and there may be more alternates here, that seems to be the area, and if there is to be any give, I recognize you need as much time as possible between the selection of the plan and the -- finishing of the study, selection and the preparing for the bond election, because that is really the critical period that the city is engaged in, but I think the give, if there is to be any, would have to be in that first portion and I don't know whether that is feasible. I think that would have to be up to the judgment of the group here.

May I ask you one more clarifying point, Mr. Kehr, while you are up?

You say bond "issue presented to the voters in the spring of 1962"; that is the kind of thing which can spread consternation in the bureaucy when we have to determine what that means. Could we put a date on that, too? And I'm not asking you for a date early. Could we say no later than -- "in the spring" -- end of May?

MR. KEHR: Actually the date I had in mind was perhaps March or April of 1962.

MR. STEIN: Can we say "not later than May 1, 1962", for purposes of clarify?

MR. KEHR: "Not later than May 1, 1962". I would be agreeable to that.

MR. STEIN: I don't know whether the folks, any of the conferees, want to comment any more on the schedule or on any other aspects.

Mr. Kinsey?

MR. KINSEY: No, I have nothing.

MR. STEIN: Mr. Happy?

MR. HAPPY: I would like to make this comment since it is of concern.

As a result of the Kansas City Conference it was determined that the first construction contracts would be awarded by January 1, 1960, and that the remainder of the contracts would be awarded by March 1, 1960, three months later.

Now, bear in mind we can't draw any direct similarity to the size of the operation, and, further, that the preliminary study in Kansas City is virtually complete as of now. The point I want to make is that your schedule to begin construction on January 1, 1963 is a full three years later, to begin construction. I would like consideration also to be given to reducing that time necessary for the preliminary study and consideration of the results of that study.

With respect to the disposal of garbage by grinding for the City of St. Louis, I should like to express a desire that the vagueness be removed by perhaps suggesting that an engineering study be made within a certain time limit to determine just what methods might be employed. If grinding discharged to the sewers and eventual treatment with the Metropolitan District is the only method, I think that should be determined by a realistic study of all possibilities and that a time be established for completing that study so that we will know when it is to be done.

MR. STEIN: Are there any other comments?

MR. KLASSEN: Not necessarily to Mr. Kehr. If I were asked point-blank to comment on this -- maybe that is what you are trying to do -- I would have to say honestly that while in Illinois we would like to see this schedule stepped up, I believe in all honesty this is pretty realistic, and I do want to compliment the trustees and Mr. Kehr for giving what we think is a pretty realistic schedule even though we for our own purposes would like to see it moved up.

Mr. Poston brought garbage back into the spotlight here, and I just want to make one comment here that concerned me about a statement that Mr. Kriz made of the recent spending, as I understood, of about a quarter of a million dollars for new garbage grinding equipment. I realize that there undoubtedly was need for that immediately, but the interpretation that I had to put on it was that for sometime to come now that is going to be their method of disposing of the garbage, which concerns us in Illinois pretty much, because we are the recipient of it.

Another reason for it was possibly grinding it a little finer so it wouldn't be seen, but the thing that concerns me as an engineer more than that is whether -- undoubtedly there were -- whether there were other studies made, and alternates considered before they adopted again or re-adopted this method of garbage disposal.

I would like a little more clarification on what led them to finally decide to go ahead with garbage grinding instead of at this time consider some other methods. It, frankly, is a little discouraging to us on the other side of the river to know that this expenditure has been made, which apparently is an indication of a continued practice of grinding the garbage -- even though it is a little finer, it is still there -- and put it in the river.

Specifically, what other alternates were considered at the time you decided to go ahead and make further expenditures for the garbage grinding equipment?

MR. KRIZ: Mr. Klassen, I thought I made it plain that we considered landfill for garbage disposal. We also considered composting garbage, which involves greater sums of money and no site to operate it, and very, very objectionable to the people, I am sure, because other cities have had the same problem. We had to move it way, way away from the city to overcome objections of the people.

We also considered hog feeding, manufacture of hog feed. That was out because nobody makes a plant, or we didn't know too much about it, the size that it would take to process 300 tons of garbage per day.

We did consider all those things, and we, when we built that plant, we had in mind that sooner or later that the city or the Metropolitan District would build a treatment plant and that this garbage would have to be ground anyway before it would go through this treatment plant.

MR. KLASSEN Then am I to assume then that you are presuming that the decision will be reached that ground garbage will go to the treatment plants if and when they are built? Is that the decision that has been reached?

MR. KRIZ: Yes, I am assuming that, and we had before the Sewer District, too, the sewer system offer, we had that in mind, that it would have to go through a sewage treatment plant because of the pollution of water involved in the Mississippi River.

Now, Mr. Poston has asked -- I think what he meant by a special small plant to handle garbage on the site of a future treatment plant, is that correct, whether a unit of some kind could be adapted to an overall treatment plant if and when it was built? I don't know; that would require quite a bit of study. I think Mr. Kehr would, I am sure, agree with me that we would have to haul this garbage to another location and put it through a separate plant, and it would involve a lot of other problems besides just the matter of treatment of the garbage at a small unit.

MR. KINSEY: Mr. Kriz, perhaps you could help some of the thinking of the people if you discussed just a moment the question of incineration. The city is now operating two incinerators.

MR. KRIZ: We have an incinerator in operation in South St. Louis and we are completing one in North St. Louis, and the matter of burning the garbage was discussed also in these incinerators, but they were already designed and not adapted to the burning of garbage because we didn't have the extra fuel needed to operate when the rubbish was wet. When the garbage was wet, it required a supplementary form of burning, heating, fuel, such as gas, to operate furnaces. We don't have any trouble when the rubbish is dry, but when it gets wet we have a hard time bringing the temperature up to the point where all the rubbish is burned properly. We operate 118 degrees in the furnaces, and when we get a lot of wet garbage that reduces the burning down and we don't have any supplementary heat.

MR. KINSEY: You did give some consideration to joint collection rather than the separate collection that you have now?

MR. KRIZ: It would have to be a joint collection of garbage and rubbish. The people of St. Louis are used to three times a week for garbage and once a week for rubbish. In addition to that the people would have to change their habits and methods and wrap this garbage if we are going to burn it, because that would be necessary, and maybe the plants could be adapted to burning. We thought the most economical way would be to grind it and pass it through a treatment plant.

Does that answer --

MR. KINSEY: Thank you very much.

MR. STEIN: Yes, thank you very much.

Mr. Kehr, one more question for clarification again: --

MR. KEHR: May I say something at this point with reference to Mr. Happy's comment, for the record, concerning Kansas City?

I would like to point out to Mr. Happy that from March 1, 1958, which is right now, to January 1, 1960, is twenty-two months, almost two years, and from January 1, 1961, when we would plan to have our preliminary study completed, to January 1, '63, is two years. So Kansas City is doing their work and only starting their construction in only two months earlier than we had scheduled here.

As to the practicability on the part of Kansas City of getting all their work under construction by -- when was it? -- March of 1960, I believe; March --

MR. STEIN: Yes.

MR. KEHR: But at any rate, just about two years or perhaps a little more. I don't know whether Kansas City has the money to start their consulting engineers on the final construction plans before the bond issue election or not, but I would question a schedule on our part of being able to complete plans for many millions of dollars of work, such as we would have, and I am sure Kansas City has, in any such time schedule.

MR. HAPPY: If I might clarify, Mr. Kehr, the point I desired to make was the difference between 1960 and 1963, those three years' difference between the two large metropolitan areas, and to explain now that Kansas City will require not entirely for deliberation, but rather to await the planning in their neighboring city of Kansas City, Kansas, to determine whether they are going to go along with them or to go separately. That is involved, too; so that part of that portion will be involved in, shall I say, waiting.

MR. STEIN: Mr. Kehr, may I point out there again, and this is for clarification, check point, generally, would you like to state when you would begin these preliminary engineering studies? It doesn't indicate here. We don't have a check point. Two and a half years at least from this time; it's much more than that. Would you say that you would begin the engineering studies in August of '58 or when would that happen?

MR. KEHR: I think it is pointed out here, it is anticipated, in Item 3, under our schedule, at the last, on page 6, the studies, it is anticipated that the money necessary for the studies will be available by July 1, 1958.

MR. STEIN: Would you say you would start then, begin these studies no later than July 30, 1958?

MR. KEHR: It's entirely possible we could start prior to that.

MR. STEIN: I say "no later than".

MR. KEHR: Well, that is going to depend on a considerable extent the Housing and Home Finance Agency.

MR. STEIN: Let me state it this way: We, as this stands, there is no check point that anyone can have for any time prior to January 1, 1961, that progress is being made, except a surmise that you may or may not be, as to date. What I am trying to do is see if we can get an equitable and reasonable date for a check point sometime before that. Could be say, for example, the previous schedule was preliminary engineering studies would be begun not later than when? July 30, 1958?

MR. KEHR: Let's put it this way: not later than thirty days after we receive approval of the advance from Housing and Home Finance.

MR. STEIN: That, again, is not a date. We are looking for a specific date, and I think -- I don't think we would be able to communicate later unless we had that. I would rather that this date be established by you as a reasonable date, because I think that would be the best --

MR. KEHR: Well, it would not be possible for us to set a fixed date without knowing what action the Housing and Home Finance Agency will take or when. In other words, as I pointed out, and I tried to emphasize it, that this study will depend, that is the start of this study, as we now see it, will depend upon the advance from the Housing and Home Finance Agency.

MR. STEIN: You would not care to set a date? I would think that the conferees may very well have to recommend a date on that for purposes of our check, because I haven't seen a time schedule yet that a state or federal agency hasn't felt it necessary to put a date when engineering studies, preliminary engineering studies were to be begun, because then we lose that check point.

MR. KEHR: While I was in Fort Worth talking to the Housing and Home Finance Agency, I asked them for some sort of a reasonable estimate as to when they felt the application might be approved if it was approved. They indicated that might be done within sixty days, so I took four months just to be on the safe side, and I feel that there is a reasonably good possibility that the loan will come through within that period of time that the studies can be started by July 1st. I think that is a fairly realistic date, unless we are refused, which would constitute something of an additional problem for the District.

MR. STEIN: That is right.

Well, thank you, Mr. Kehr.

Now, I think with the conferees we may go over the areas we have here to see if we are in agreement.

As I understand it, on the Illinois side of the river all the Illinois communities and industries, it is proposed, will have financing arranged for adequate waste treatment facilities and submit construction plans to the Illinois State Sanitary Water Board not later than January 1, 1959; is that my understanding, correct or not?

MR. KLASSEN: That is our present scheduling, but to be realistic, there are instances where that undoubtedly cannot be met. We would, however, prefer to extend those times when there is evidence that they cannot be met and not presuppose at this time that those dates cannot be met.

MR. STEIN: We would take that as a final report from the folks in the state.

Now, I think when we talk in terms of arranged financing, when that deals with a municipality or a sanitary district, or levee district, or other political subdivision, that means that the issue will be presented to their voters, if that is necessary, by that time, or otherwise that the financing will have been maintained. Again, for the Illinois industries and for the Illinois communities, construction of remedial works will be started not later than July 1, 1959, and these works will be in operation not later than December 31, 1961.

Now, the next point we get to is the question of garbage, and I don't think we have a clear expression from the conferees yet. As I understand the discussion we can have several proposals.

(1) That the conferees make a recommendation after suitable study that the practice of discharging ground and untreated garbage into the Mississippi River be discontinued; or

(2) That we just make a recommendation that a study be made now

I wonder if for this session we might get an expression from you folks here whether we want to make a recommendation that this practice be discontinued or not? Does anyone want to speak to that here?

MR KLASSEN: I can start this off by saying that was the purpose for some of my questions and I have reached the conclusion from the answers given even though I don't like to face those conclusions that the decision has already been made that the disposal of the garbage is going to be into the sewage treatment plants that are proposed for the District Now to require that it be removed immediately would be in effect as I see it to say temporarily solve part of the stream pollution now by a temporary means I'm not too sure that that might not be practical

MR. STEIN Are there any other views on this?

Mr Poston do you have a comment?

MR POSTON In a statement by the Metropolitan District they felt that the sewage problem in the District was of greater importance and more critical than in the Mississippi River below St Louis I wonder if that applies to this disposal of garbage into the river? To me it seems a little bit ridiculous to persist with the dumping of garbage into the river for another eight or nine years

MR STEIN How do you feel about that Mr Happy? Do you want to comment?

MR HAPPY My views are that we should have some clear-cut procedure to determine what is to be done I would propose that an engineering study be made of the garbage grinding practice and that a report be forthcoming at an early date

In the instance of Omaha Nebraska where the Division of Health participated in a conference immediate discontinuation of the stockyard material was agreed upon

In the instance of St Joseph Missouri immediate discontinuation of the discharge of garbage by dumping was not granted and the discharge of stockyard wastes was discontinued

In the instance of Kansas City it wasn't necessary. They had already discontinued.

Therefore, I think a date should be set, upon a report following a realistic engineering study, to determine what should be done

MR. STEIN: Is that report satisfactory to the other conferees?

MR. KINSEY: It is to me.

MR. KLASSEN: Yes, and, further, a justification other than the mere removal of garbage from St. Louis for that decision. We don't quite like the idea of the general theory of removing refuse from a community, as much as we know it must be removed, and 300 tons of garbage is a lot of garbage, but to dispose of that to the detriment of someone else just doesn't quite fit into our thinking, frankly.

MR. STEIN: I don't think the Public Health Service has ever gone along with that service in any interstate situation either.

MR. KLASSEN: I merely want to be on record as seconding the suggestion by Mr. Happy.

MR. STEIN: I think if we can get this a bit firmer -- how long do you think a reasonable time for such a study would be? Do you have any definite date? Do you think that could be completed, for example, by July 1st of this year?

MR. HAPPY: I think it is entirely desirable that it be, if that is to be the ultimate date of the Metropolitan District's date.

MR. STEIN: Do you think that we could ask the State Health Department to see that they perhaps get that report from the city and make that available to the other conferees? Would that be appropriate on this study?

MR. HAPPY: Yes.

MR. STEIN: Now I think we will do that with the garbage situation.

Now, so far as the plans for, and I will go over these perhaps twice, for the Metropolitan St. Louis Sewer District are concerned, we have (1) the Meramec River Watershed, and my notes indicate that changes in improvements to the waste treatment plant serving this area, which will create a satisfactory treatment, will be completed by January 1, 1959.

Coldwater Creek Watershed a bond issue for construction of the treatment plant will be submitted to the voters prior to January, 1959; construction will be begun not later than July 1 1959; the treatment plant facilities will be completed by January 1, 1961 and the trunk sewer will probably or might require an additional nine months or up to September 1, 1961 for completion.

As far as the Mississippi Watershed is concerned, preliminary engineering studies will be begun not later than the end of July, 1958. These studies will be completed by January 1, 1961. The bond issue to arrange for financing will be presented to the voters not later than May 1, 1962. The construction of the first units of the remedial works will begin not later than January 1, 1963, and the complete remedial works will be in operation not later than January 1, 1967; that the district will continue its program of working with industries to reduce to a practical minimum the industrial waste load and screen, and this work will be completed by January 1, 1961 with the understanding that it might be additional time may be necessary for industries requiring preliminary treatment before they discharge into the district sewers.

Now, are there any comments on our understanding? If not, I will try to summarize the conference at the present time, and, again, you can make amendments. Some of this will be repetitious because of the stuff we just went over but I think the conferees agree that the Mississippi River, in the St. Louis Metropolitan Area, and below, forms a boundry between Illinois and Missouri and is clearly an interstate water within the definition contained in the Federal Act, and that pollution originating in one state and affecting the health and welfare of persons in another state is occurring; that the principal contributors to pollution in thisarea are the following communities: sanitary districts and institutions in Illinois: Alton, East Alton Wood River, Hartford, Granite City, Madison, Venice, East Side Levee and Sanitary District, which includes Brooklyn, Cahokia, East St. Louis, Fairmont City, National City and Washington Park and as well as the previous named cities of Granite City, Madison and Venice, Monsanto, Dupo, Columbia, Illinois State Prison, Menard Branch, and Chester. The principal contributors to pollution in this area on the Missouri side: St. Louis, Missouri and the St. Louis Metropolitan Sewer District; that the pollution is caused by discharges of inadequately or untreated municipal and industrial waste to the Mississippi River; that the pollution of the waters of this reach of the Mississippi River contribute significantly to (1) increased concentrations of coliform and other organisms associated with human disease which constitute a health hazard to commercial and recreational users of the river; (2) deterioration of the water quality to the extent that severe sight and odor nuisances have been created due to floating solids and sludge deposits, contaminating the river as a residential, sightseeing and recreational area; and (3) impairment of water quality so as to render the river unsuitable as a habitat for game fish and practically destroying its use as a commercial fishery

Now, the conferees also agree that remedial action should be taken to clean up or control this pollution by municipalities and political subdivisions and by industries in this area

On the Illinois side of the river the conferees agree that all industries political subdivisions municipalities and institutions arrange for their financing for adequate remedial works and in the case of municipalities and political subdivisions this will mean submitting financial plans to the voters and submitting construction plans detailed plans and specifications to the Illinois State Sanitary Water Board not later than January 1, 1959 that construction of these remedial works be begun not later than July 1 1959 and that these remedial works be put in operation not later than December 31, 1961

The conferees considered the practice of St Louis collecting and grinding its garbage from the entire city putting it into the sewers and discharging it untreated to the Mississippi River The conferees were all agreed that this was a very unsatisfactory practice The conferees agree to recommend that the city make an engineering study of this and submit the results of that study and have the problem to the Missouri Division of Health not later than July 1 1958 At that time the Missouri Division of Health would make this study available to the other conferees. The conferees recommend that this study assign a justification for the continuation of this practice if this practice is to be continued and that justification be based on some other factor than just the fact that St. Louis has to get rid of its garbage and that as far as the sewage disposal from the Missouri side of the St Louis Metropolitan area it is agreed that the agency charged with the responsibility for getting rid of this waste is the St. Louis Metropolitan Sewer District; that the conferees agreed to the following time schedule for remedial work for that district.

That an adequate waste treatment plant for the Meramec River Watershed would be completed by January 1 1959 This would involve changes and improvements to the existing plant

As far as the Coldwater Creek Watershed is concerned a bond issue will be submitted to the voters prior to January 1, 1959 for the construction of an adequate waste treatment plant Construction of this plant will be begun not later than July 1 1959 and completed not later than January 1 1961 The trunk sewers would be completed, in connection with this plant not later than September 1 1961

As far as the Mississippi River Watershed is concerned, the studies looking toward a comprehensive plan for adequate waste treatment and disposal would be begun not later than July 30, 1958. These studies will be completed not later than January 1, 1961; and the financing and the bond issue will be presented to the voters not later than May 1, 1962. Construction of the first units of these remedial facilities will be begun not later than January 1, 1963, and the complete facilities would be placed in operation not later than January 1, 1967.

The conferees in addition agree that the St. Louis Metropolitan Sewer District will continue its program of working with industries in the area to reduce to a practical minimum the industrial waste flow on the Mississippi River. This work will be substantially completed by January 1, 1961, with the recognition that additional time may be necessary for those industries where preliminary treatment may be required before permitting discharges into the St. Louis Metropolitan Sewer District sewers.

Now, are there any suggestions for additions or changes to the summary?

MR. LISCHER. I would like to comment on the schedule for the East Side.

As I understood, it called for submitting plans about July 1, 1959 and construction to begin about a year later, isn't that right?

MR. STEIN: That is correct.

MR. LISCHER. The statement that was --

MR. STEIN: I would like to amend that. January 1, 1959 for plans and construction July 1, 1959.

MR. LISCHER: Yes. Well, in the statement submitted for the Sanitary District, a date for the bond issue was given a July, 1960, and, of course, the final plans could not be started until that time, and the date for placing the services in use was in the year 1963.

MR. STEIN: Thank you, Mr. Lischer.

I wanted to make one other point in this, and this may clarify it.

I understood that was a condition, and I understood too that I will recommend keeping with this target date, with the recognition that there might be situations where the complete adhering to the date couldn't obtain. One of the things we always have coming out of these conferences, and I put it in the summary here with the suggestion of the other conferees, is that the conferees, both the Illinois State Sanitary Water Board and the Missouri Division of Health, make progress reports to the other conferees at six-month intervals, beginning July 1st of 1958, and that these reports indicate progress being made, and if any deviation from the schedule is made, a justification for that deviation. Would that be acceptable?

MR. KLASSEN: Yes. I think I covered that in the statement if any additional time is needed, the Board would consider it at the time rather than presupposing now that that schedule couldn't be met in any particular instance.

MR. STEIN: Are there any other comments on the summary? If not, I just want to make one announcement.

We very often get questions as to whether the summary of the conference and the transcript, whether these will be available. Both the summary and the transcript will be made available through the state agencies concerned, and the interstate agency in this case, the Bi-State Development Commission. In other words, when the transcript and summary come out, you can ask Mr. Klassen, Mr. Happy or Mr. Kinsey for a copy, and I am sure they will be glad to give you a copy.

I think I would like to emphasize one more thing.

The purpose of our doing this is to carry out the judicial role of the service to encourage states and interstate agencies in these activities. Now, we would like to, as much as possible, and as you can see the recommendations of the conference as much as possible places certainly the primary responsibility to see that this is going to be done from the state agencies, and I think the primary contact point of you folks is with your state agencies on this matter.

Now, are there any other points that anyone in the audience might want to bring up before we close?

MR. HAPPY: If I might amplify on that last point, contained in these summaries, for those of you in Missouri, this will give you some idea, this is a transcript of the Kansas City conference. The Public Health Service prepared this, and it is quite a little job. Perhaps a month or at least two months, I would think, might be required for that purpose. If, in the meantime, those of you in Missouri would just send a letter to the Division of Health, we will make sure that you receive a copy of this.

MR. STEIN: I want to thank you all for coming, a great number of you for your excellent participation. I think we have made some magnificent progress here, and I think this advice we have received in the conference has been of tremendous help, I know to us, and I hope to the states, and perhaps to you, in getting the problem on the table, getting it discussed and trying to work toward an equitable and reasonable solution.

Thank you very much. The conference is adjourned.

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ATTENDANCE ROSTER

Aschoff, A. F.	Union Electric Company St. Louis, Missouri
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